plating

A HALF CENTURY OF SERVICE TO ELECTROPLATING, METAL FINISHING AND ALLIED ARTS
GOLDEN JUBILEE
1959
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1959

JOURNAL OF THE AMERICAN ELECTROPLATERS' SOCIETY

University Microfilms
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Ann Arbor, Michigan

AIRCRAFT ISSUE • NOVEMBER

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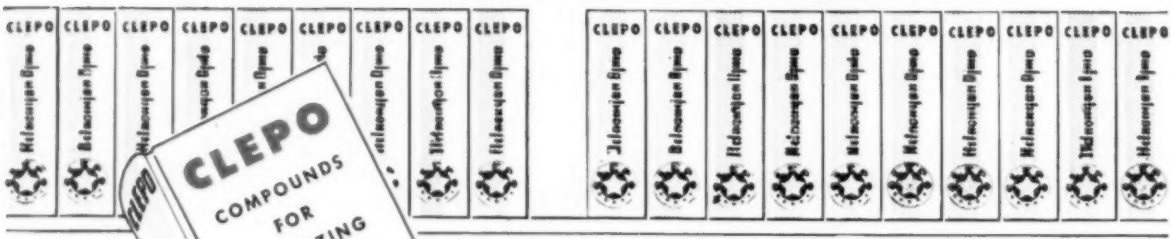

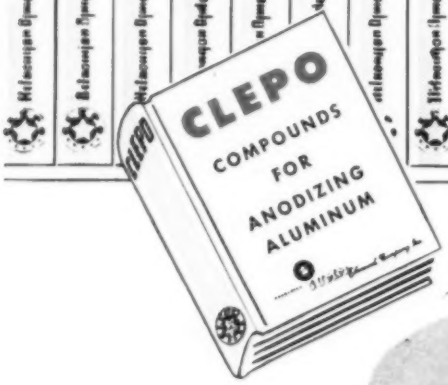

CLEPO 28-AS

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CLEPO 180-K

CLEP-ETCH "A"

THE COMPOUNDS PROVED MOST EFFECTIVE IN PREPARING ALUMINUM FOR ANODIZING

CLEPO 90-J

CLEPO 30-R

So thoroughly proved are these CLEPO compounds that we are inclined to issue a warning: don't attempt to anodize aluminum *without* using CLEPO-made formulations for preparing your aluminum parts for this treatment. For CLEPO compounds will definitely:

- remove oil and dirt without attacking the base metal
- remove buffing compounds without tarnishing the highest polish on the aluminum
- remove oxide and scale without dangerous acid
- remove smut after etching without fuming or hot acid
- remove smut from silicon-base alloys without hydrofluoric acid
- remove anodize coatings from rejects or racks without hot solutions

These are six outstanding CLEPO compounds useful in the field of anodizing, each formulated to do certain jobs best.

If your production involves anodizing, phone or write to have a CLEPO Field Service man call to demonstrate the benefits CLEPO compounds can bring you. Or if you have some particular steps that are bothering you and want a quick answer, send us the details. We'll be glad to make recommendations and send you a trial sample.

FREDERICK

2FG-11

GUMM *Chemical Company Inc.*

538 FOREST STREET, KEARNY, N. J.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 1100.

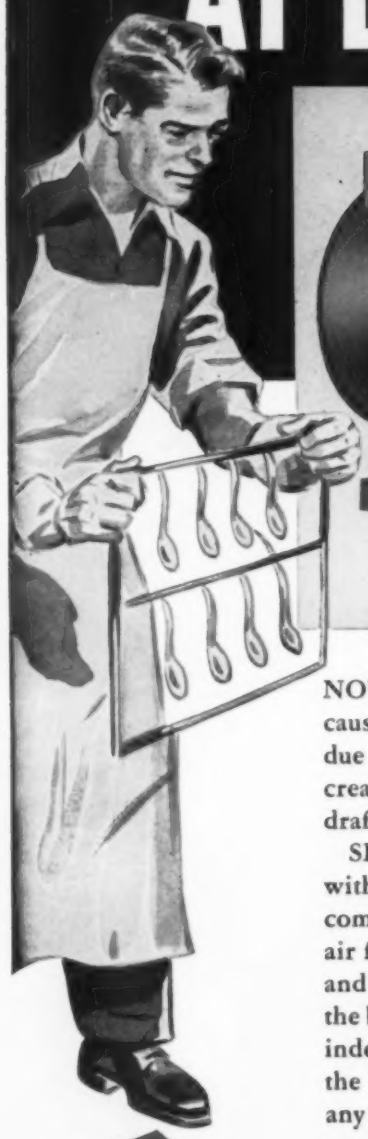
INDICATE A 1101. ➤

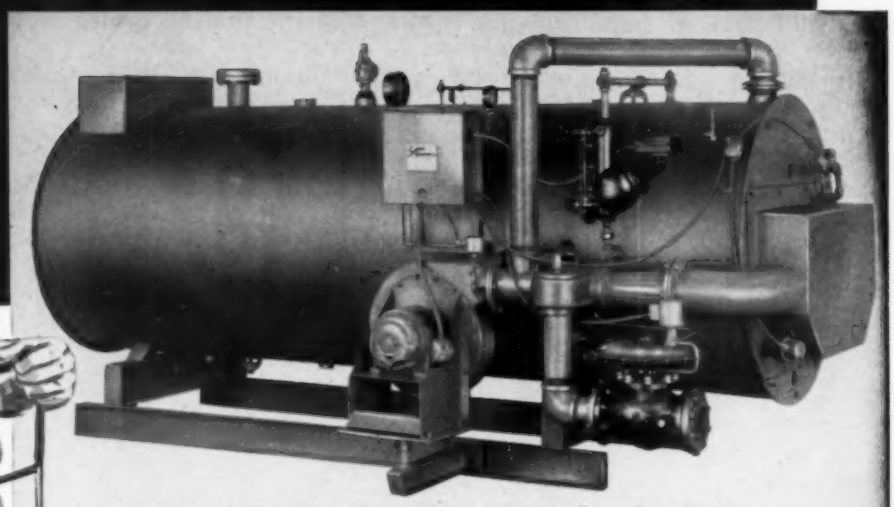
How to make plating upon aluminum an exact science: For many years, hundreds of manufacturers have been using Alumon,® an Enthone process, to prepare aluminum alloys for electroplating. Enthone chemists work out the plating cycles, give in-the-plant assistance. Alumon is an easy process to use and it costs less than ½¢ per square foot of surface plated! Write for literature about this economical and efficient process. Also find out about Etchalume,® Weldal,® and other specialized Enthone compounds for finishing aluminum. Enthone, Inc., 442 Elm Street, New Haven 11, Connecticut.

ENTHONE

ENTHONE, INC. IS A SUBSIDIARY OF AMERICAN SMELTING AND REFINING COMPANY

AT LAST A BOILER DESIGNED FOR THE PLATER!





Model 105 Sellers Closed Combustion Chamber Boiler

NOW—No more foul fumes because of incomplete combustion due to back draft through boiler created by exhaust fans or poor draft conditions.

SELLERS solves this problem with the improved design, closed combustion chamber boiler. All air for combustion, both primary and secondary, is pushed through the boiler under positive pressure, independent of partial vacuum in the building and independent of any back draft on the chimney (of course, products of combustion must be removed from building).

A positive pressure blower supplies air under pressure which is mixed with the gas and passed to burners in the completely closed combustion chamber; to complete combustion, secondary air is fed into the closed chamber under positive pressure (many times greater than the vacuum in the building). By this method of securing positive complete combustion, burned gases are pushed through the boiler and FOUL FUMES ARE ELIMINATED.

Read about these Extra Features in Catalog 5206

1. NOW—SCHOOL ROOM QUIET
2. ALL-ON, ALL-OFF RUNNER PILOTS
3. NO OPEN FLAME
4. WORKS ON LOW GAS PRESSURE
5. POSITIVE PRESSURE BLOWER OVERCOMES BUILDING VACUUM AND CHIMNEY BACK DRAFT
6. SIZES FROM 15 HP TO 200 HP

Sellers ENGINEERING CO.

4876 N. CLARK STREET CHICAGO, ILL.

Blast Heaters • Immersion Automatic Water Heaters • Combustion Units • Industrial Gas Burners
Vertical Steam Boilers • Immersion Tank Heaters • Gas Combustion Equipment

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SOCIETY of BUSINESS MAGAZINE EDITORS

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plating
JOURNAL OF THE AMERICAN ELECTROPLATERS' SOCIETY

November 1958 — **Vol. 45, No. 11**

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Harshaw Announces *Another Addition*
to its growing family of Bright Nickel Plating Processes

HARSHAW

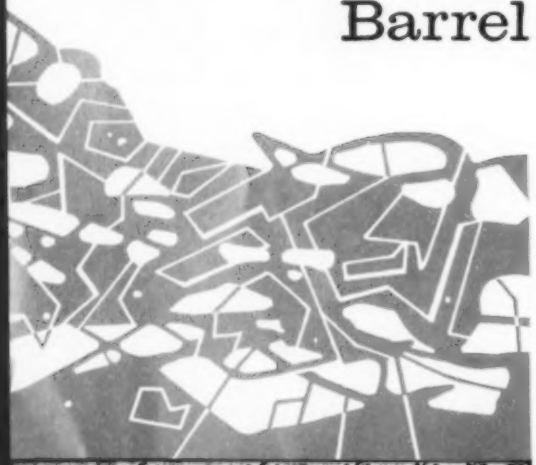
Harshaw

Super NIBRITE

Barrel Bright Nickel Process

The Harshaw Chemical Company has developed the SUPER NIBRITE BARREL BRIGHT NICKEL PROCESS to produce a lustrous and ductile nickel deposit by the use of only two brighteners, both of which are liquid addition agents. These addition agents are non-metallic, organic type brighteners designated as BBN #1 (the primary brightener) and BBN #2 (the secondary brightener).

Among the many advantages of the SUPER NIBRITE BARREL NICKEL are its superior brightness, excellent leveling, ductility, ease of operation and control, tolerance to organic and metallic impurities, and its receptiveness to chrome plating.



Brightness. The SUPER NIBRITE nickel plate is bright over a wide range of current densities and temperatures.

Leveling and Ductility. For a barrel nickel the SUPER NIBRITE nickel plate has amazing leveling and ductility over its entire operating range.

Ease of Operation and Control. The recommended operating conditions for SUPER NIBRITE nickel are a pH of 4.0-5.0 and a temperature of wide range up to 140°F. The BBN #1 concentration can be high without any ill effect on the operation of the bath and since it is lost mainly only through drag-out, additions can be made in proportion to the nickel salts added to replace drag-out losses. The amount of BBN #2 used in any specific installation varies with the type of work, finish of the base metal, and the required finish. Additions can be made with ease prior to the end of plating time.

Tolerance to Impurities. SUPER NIBRITE solutions remain ductile and bright over long periods of operation due to the high tolerance of the solution to both organic and metallic impurities. There are no unusual breakdown products from the organic brighteners themselves and thus any measures taken to avoid severe contamination will result in trouble-free operation. Also carbon treatments and filtrations, if necessary, can be performed without undue loss of the brighteners.

Extended Periods of Idleness. SUPER NIBRITE baths can be operated after extended periods of idleness without sacrificing loss of brightness or ductility.

Speed. The greater conductivity and faster plating rates obtained by operating the solution at 140°F can be used to great advantage by reducing the plating time for a desired finish up to 50%.

Contact the Harshaw Branch nearest you. Harshaw representatives will be happy to discuss with you the application of this process in your plant.

The Harshaw Chemical Co.
1945 East 97th Street • Cleveland 6, Ohio
CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES
HASTINGS-ON-HUDSON, N.Y. • PHILADELPHIA • PITTSBURGH

EDITORIAL

SEEK and YE SHALL FIND

OUR SOCIETY HAS REACHED its fiftieth milestone of progress by earnestly living up to the second paragraph of the Preamble to our Constitution:

> "THE OBJECT OF THE SOCIETY SHALL BE THE IMPROVEMENT AND DISSEMINATION OF THE KNOWLEDGE OF THE ARTS AND SCIENCES OF ELECTROPLATING AND OF FINISHING OF METALS AND OF ALLIED ARTS, THE DEVELOPMENT OF A COOPERATIVE SPIRIT OF FRIENDSHIP AND MUTUAL ASSISTANCE AMONG ITS MEMBERS."

It would be well for all to reread this part of the Preamble and meditate for awhile so that we may be aware of the reasons we have developed into a truly "National Society." Our members through the past years have searched diligently for ways and means of improving the arts and sciences as evidenced by the vast number of developments over the past years. The fruits of these improvements would not have shown themselves as they have, were it not for the cooperative spirit of friendship and mutual assistance shown among our membership.

Our challenge for continued advancement during our next fifty years will become more critical with the development of the Atomic Age. In the new era, we will be confronted with many new problems requiring us to delve further into the science of electrodeposition.

We should, however, feel blessed that we may enter this new era confident that our Society possesses vast resources which are strong and sound. Our membership is composed of well-qualified persons with inquiring scientific minds. We have only to look at the large number of basic research projects covering all phases of electroplating to know the scope and magnitude of our endeavors.

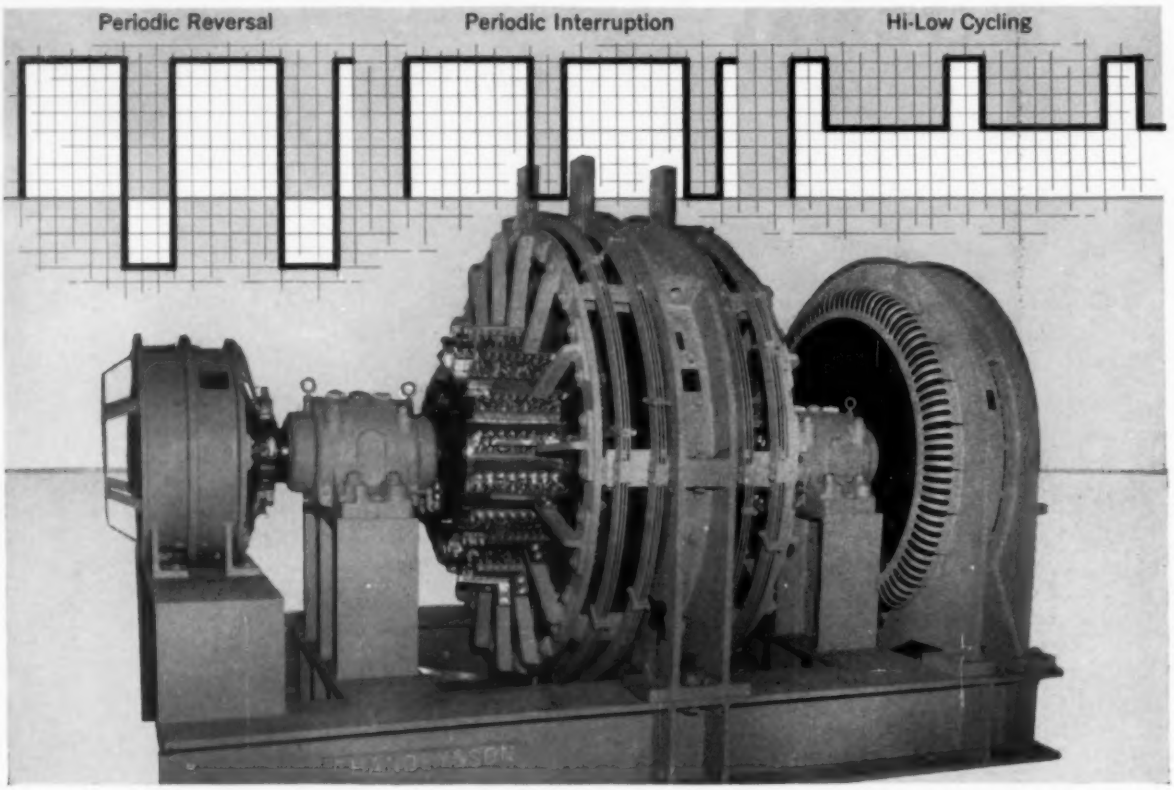
To all AES members and those who have an interest in the field of electroplating, let us continue to seek out information for the betterment of this challenging field. Adopting this attitude, we will find the next fifty years to be even more fruitful than the past. We will then render even greater public service as a nationally recognized scientific society.

Chester G. Bovlet

Third Vice President

◄ INDICATE A 1103.

GREATEST **flexibility**... AT THE LOWEST COST



...PROOF THAT MOTOR GENERATORS ARE YOUR MOST ECONOMICAL FORM OF LOW-VOLTAGE POWER

Chandeysson **generators keep pace with changing needs of your plating operation.**

Throughout the plating industry, companies depend on Chandeysson Motor Generators as their most flexible form of low-voltage power. When plating current must be reversed, interrupted, or changed suddenly, generators do the job at a much lower additional cost than other types of power conversion equipment. Usually, extra control gear costs less than 2% of the original M.G. set price. Comparable changeover nearly *doubles* the cost of other kinds of power conversion equipment.

Flexibility is just one of many reasons why the plating industry *insists* on Chandeysson low-voltage generators for direct current power needs . . . for extra capacity to meet emergencies at the lowest possible cost.

For full information, write now for new booklet D-103.

CHANDEYSSON ELECTRIC COMPANY

4078 Bingham Avenue • St. Louis 16, Missouri

This Advertising Opportunity Knocks Once In A Long, Long Time.

PLATING MAGAZINE's parent, American Electroplaters' Society (AES), is currently observing its Fiftieth Anniversary, and the full year's observance, launched July 1, 1958, is gaining momentum from every standpoint.

LED by 50 AES Branches in the United States supplemented by 5 in Canada and 3 in Australia, the Golden Jubilee is targeted for large educational and institutional impact.

AND not only will AES's year-long Fiftieth Anniversary observance be climaxed by its Golden Jubilee Convention and Industrial Finishing Exposition, including the Fifth International Conference on Electrodeposition and Metal Finishing, to be held in Detroit, June 15-19, 1959 with the AES's Detroit Branch as host, but also by PLATING MAGAZINE's Golden Jubilee issue to appear in June 1959.

THIS Golden Jubilee Issue, a unique feature edition, will be beamed both for immediate interest and value to PLATING's global circulation and for long retainment by its readership as an AES reference source and as a memento of the Society's arrival at its half-century milepost of service to electroplating, metal finishing and allied arts.

IMAGINE the arresting power, merchandising strength and remembrance value afforded to company product and institutional advertising by such a unique issue.

NOW is the time to assure yourself of advertising space accommodation, both product and institutional, in that issue because demand looms large, particularly for special, preferred or premium advertising positions.

GIVE our advertising people here the privilege of hearing from you at the earliest possible time as to the extent of advertising space investment that you intend to make in PLATING MAGAZINE's Golden Jubilee Issue. You'll be glad you did!

FOR COMPLETE STORY, write or phone today!
445 Broad Street, Newark 2, New Jersey
Telephone: HUmboldt 2-3400

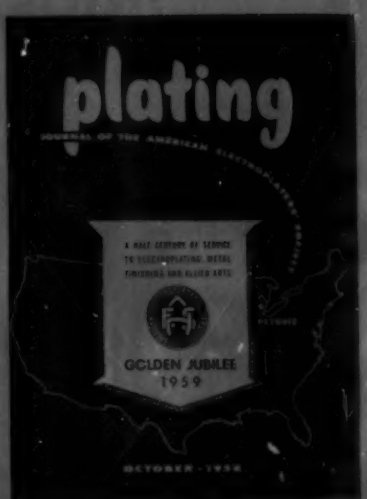
A magazine's subscription renewal percentage is a gauge of the strength and stability of that publication. It is a fact of prime interest and importance to advertising space buyers.

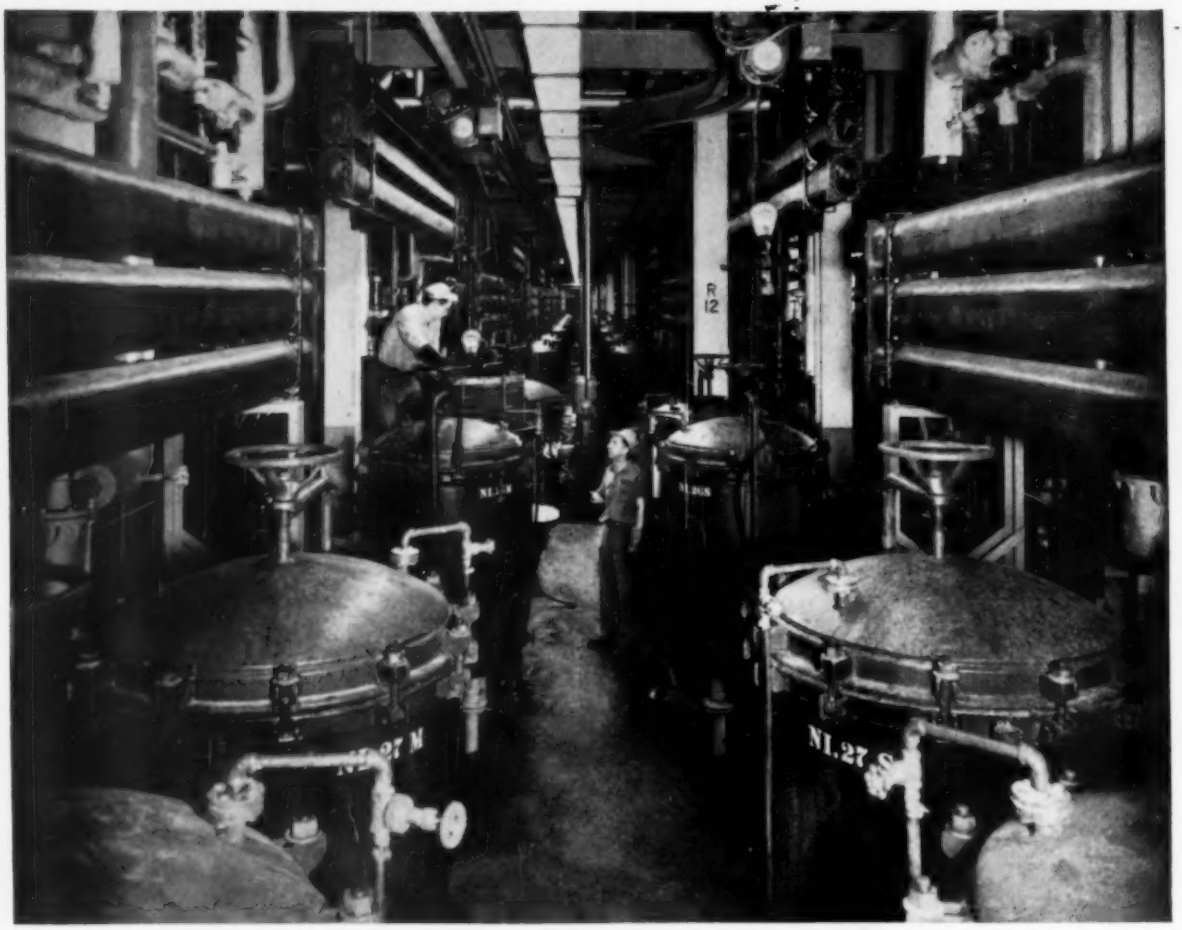
PLATING MAGAZINE is proud of its renewal percentage, reportedly highest among ABC-audited publications in this field.

Of PLATING subscriptions (AES members) that expired during the 12-month period ending October 31, 1957, some 91% or 6520 of 7168 such subscriptions were renewed.

Of PLATING subscriptions (AES non-members) that expired during that same period, over 78% or 851 of 1087 such subscriptions were renewed.

The foregoing data are from the Publisher's Statement of PLATING MAGAZINE for the six-month period ending June 30, 1958, latest available at this date (November 1, 1958).





48 Sparkler Horizontal Plate Filters in this installation

Why do the largest plating plants in the world Choose SPARKLER FILTERS?

The answer is simple, and obvious to plating engineers.

First — the cake on a Sparkler Horizontal plate filter will not crack or fall off with a variation in pressure or with a complete shut down of filtering. ***Second*** — dry cake disposal eliminates the sewer problem. ***Third*** — the quick-change plate assembly reduces the down time for cleaning each filter to a matter of minutes.

This is why many of the world's largest plating plants use Sparkler Filters exclusively.

Plating engineers can get full cooperation at Sparkler on any size installations.

SPARKLER MANUFACTURING CO., Mundelein, Ill.

Filtration engineering and manufacturing has been our exclusive business for over 30 years

Manufacturing plants in Canada, Holland, Italy, Australia

Service representatives in principal cities throughout the world

Metal Finishers, Inc., uses Mutual Chromic Acid in its "Mecrome" plating of cylinder liners. Each liner is examined with a microscope (above). Microphotograph shows uniformity of pockets which retain lubricating oil.

Combine your plating skill with high quality Mutual Chromic Acid

For longer-lasting, more uniform chrome wearing surfaces..

Uniform porous chrome plating in cylinder liners can increase cylinder life up to five times. To get this uniformity requires plating skill *and*—high quality Mutual Chromic Acid.

Mutual Chromic Acid is always 99.75% pure—or better. Sulfate content never exceeds 0.1%, permitting closer control of the acid-sulfate ratio in the bath. This is one reason why many of the country's leading platers specify Mutual Chromic Acid.

A booklet, "Mutual Chromium Chemicals," offers information on chromic acid and other Mutual products. Just mail the coupon for your free copy.

Mutual chromium chemicals

Sodium Bichromate
Sodium Chromate
Chromic Acid
Potassium Bichromate
Potassium Chromate
Ammonium Bichromate

SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N.Y.

Allied Chemical

MUTUAL chromium chemicals are available through dealers and SOLVAY branch offices located in major centers from coast to coast.

Solvay Process Division
Allied Chemical Corporation
61 Broadway, New York 6, N. Y. Dept. 8-11

Please send me Bulletin #52—"Chromium Chemicals."

NAME_____ TITLE_____

COMPANY_____

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CITY_____ ZONE____ STATE_____

This is the
GERMANIUM
RECTIFIER
that will...

REDUCE YOUR LOST POWER COSTS 45.5%

Proven in world-wide
use to be the most
efficient rectifier
available for
plating applications

Of all semiconductor types...

the Germanium Rectifier features

the lowest voltage loss!

This factor alone can mean real year 'round power savings in your plating operation! For Example: Operating ten hours a day, six days a week, 10,000 ampere germanium power supply will save 912 KWH per week over a silicon unit of the same rating...an annual savings in power dollars amounting to $948.48! These figures are based on an estimated national average cost of $.02 per KWH. If you pay more...you'll save more!

THIS 600 AMPERE hermetically sealed rectifier junction incorporates the largest single crystal junction ever developed. This assures low current density in the crystal despite the extremely high current rating. Result: Added capacity in cases of over temperature and overload.

THE CAST ALUMINUM airfoil housing removes heat at optimum rate. It prevents failure from overheating—a major cause of breakdown. Exclusive construction design makes this rectifier highly resistant to corrosive atmospheres.

THE 98.9% EFFICIENCY attained by this junction is the highest ever, resulting in marked power savings over other types, according to actual records of typical plating supply manufacturers.

FOUR YEARS OF THOROUGH TESTING and use in leading electrochemical plants throughout the world prove its exceptional reliability.

TO SUM UP: In terms of efficiency, size and initial cost—this germanium rectifier junction is absolutely the best for any plating application, from 1,000 to 200,000 amperes!

WHEN YOU BUY A POWER SUPPLY—BE SURE IT CONTAINS THIS RECTIFIER JUNCTION.

Produced for Leading Equipment Manufacturers by

International Rectifier Corp.

INTERNATIONAL RECTIFIER CORPORATION · EXECUTIVE OFFICES: EL SEGUNDO, CALIFORNIA · PHONE: OREGON 8-6281 · NEW YORK DISTRICT OFFICE: 132 E. 70TH ST., PHONE TRAFALGAR 9-1330 · CHICAGO DISTRICT OFFICE: 205 W. WACKER DR., PHONE FRANKLIN 2-3626 · NEW ENGLAND DISTRICT OFFICE: 17 DUNSTER STREET, CAMBRIDGE, MASS., PHONE UNIVERSITY 4-6520 PENNSYLVANIA DISTRICT OFFICE: SUBURBAN SQUARE BLDG., ARDMORE, PENNA., PHONE MIDWAY 9-1428 · MICHIGAN DISTRICT OFFICE: 1799 COOLIDGE HIGHWAY, BERKELEY, MICH., PHONE LINCOLN 8-1144

WORLD'S LARGEST SUPPLIER OF INDUSTRIAL METALLIC RECTIFIERS • SELENIUM • GERMANIUM • SILICON

INDICATE A 1107.

Service

Technical service with a capital S

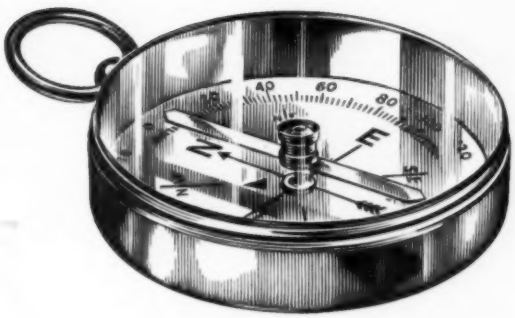
. . . yours when you specify and use Diamond Chromic Acid

You get the latest facts on all phases of chromic acid application, research and testing. Facts that can help you lick a production problem, quality problem, or research problem.

One such fact—DIAMOND CPA 1800 is *the additive* for chrome plating which increases plating speed, expands tank capacity, improves throwing power and the metallurgical character of chromium plate.

For top-quality plating get DIAMOND CHROMIC ACID and DIAMOND CPA 1800 *plus* all the facts from your Diamond Representative or your nearby Diamond Distributor. They can supply DIAMOND CHROMIC ACID where and when you need it. Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals



ENCOMPASSING THE WORLD...

INFILCO

EMINENCE IN ENGINEERING DESIGN OF WATER, SEWAGE & WASTE-TREATING EQUIPMENT...SINCE 1894

INFILCO INC. ✱ GENERAL OFFICES: TUCSON, ARIZONA, FIELD OFFICES THROUGHOUT THE UNITED STATES AND IN FOREIGN COUNTRIES

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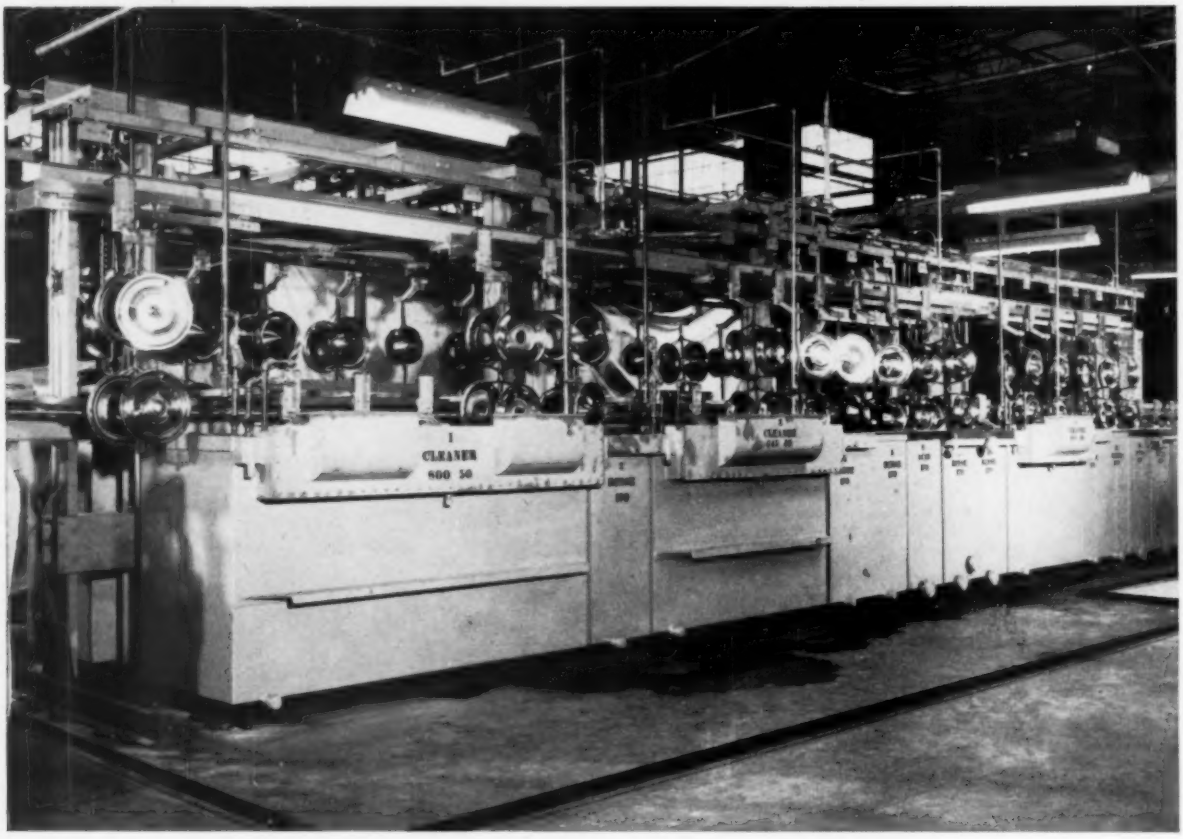
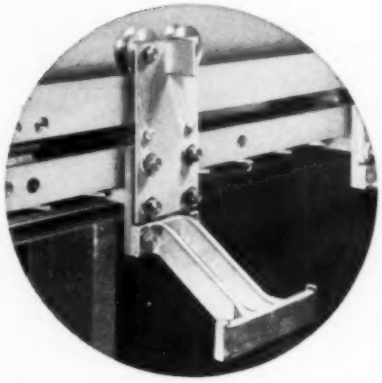


New Meaker Uniline machine provides high quality plating at high speeds

This **Meaker Uniline Plating Machine** was built to meet the rigid requirements of Namsco, Inc. in Bellwood, Illinois. It provides them with a continuous **uninterrupted high speed operation** that produces extremely high quality plating of replacement hub caps and wheel covers. This Meaker single row machine has a production capacity of **120 racks per hour** and handles the complete operation from cleaning to Nickel and Chrome plating.

Effective vertical length of rack is 34″, width in direction of travel is 15″ and tank widths are 16″.

For your plating or anodizing equipment, look to Meaker . . . the name backed by a reputation for building the best for 50 years.



Electrical contacts on carriers are positive in action due to constant load pressure and the current path from cathode rail to rack is short, minimizing voltage loss.

write for New Bulletin U-658

MEAKER
METAL FINISHING EQUIPMENT

THE MEAKER COMPANY
1633 SOUTH 55TH AVE., CHICAGO 50, ILL.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 1110.

Is rust on precision parts a problem in your plating department?

FERLON REMOVES RUST WITHOUT HARMING METAL!

Wyandotte Representative Wm. Heinecke (left), and C. D. Roberts, Chief Chemist at A. O. Smith Corporation's Pacific Coast Works at Los Angeles, examine rust-free iron castings. A. O. Smith uses Wyandotte FERLON in soak tank — also adds it to the electrocleaner to enhance smut removal, improve detergency, prolong cleaner life.

THAT'S RIGHT! When damaging rust goes to work on steel parts, you can save time and replacement costs by using Wyandotte FERLON, alkaline de-rusting compound. That's because FERLON, unlike acids, removes rust quickly WITHOUT INJURY TO SOUND METAL — makes it ideal for use on expensive, close-tolerance machined parts!

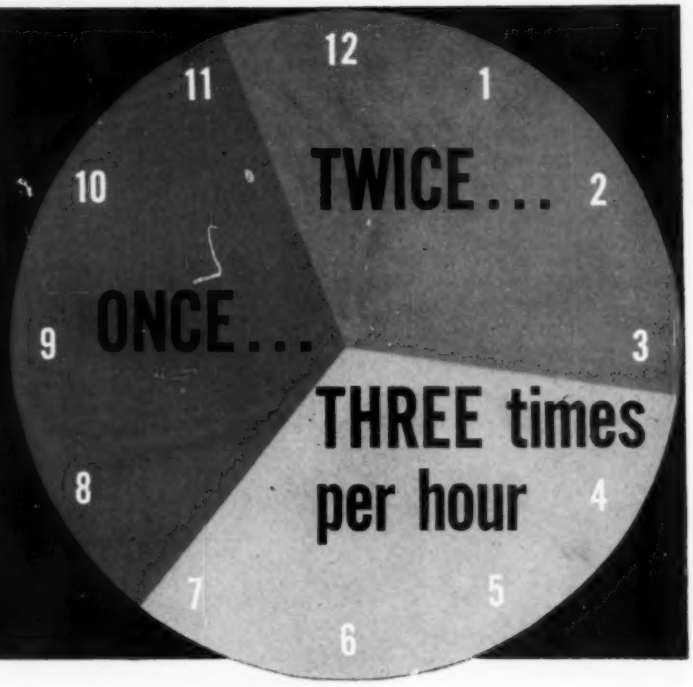
For example, at A. O. Smith Corporation's Pacific Coast Works, a simple immersion in FERLON effectively removes heavy rust from large machined cast-iron parts. In addition, FERLON in the electrocleaner has resulted in much cleaner, smut-free castings. Cadmium plating is much brighter and of a higher quality.

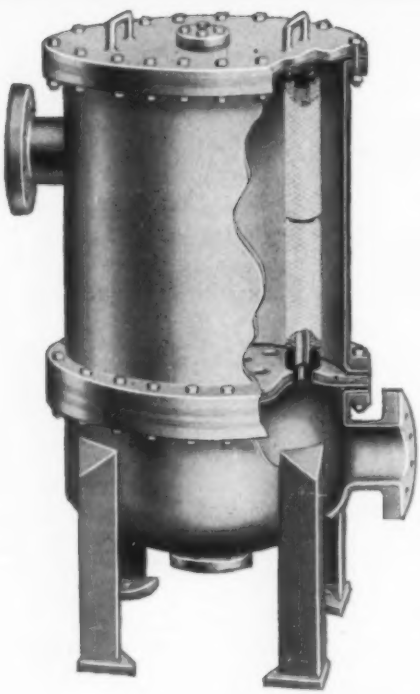
Improve *your* plating by using FERLON for rust and smut removal. Call in your Wyandotte man, today, for a demonstration. Or write direct for complete details. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

Wyandotte
CHEMICALS
J. B. FORD DIVISION

The Best in Chemical Products for Metal Finishing

Fulflo FILTERS provide COMPLETE tank turnover—





It's no longer costly to get complete tank turnover three times per hour. And you don't need big, cumbersome filters to do it! Inexpensive, compact Fulflo Filters remove impurities as fast as they're formed and assure flawless plating quality — by providing *triple tank turnover each hour.* This gives you complete solution filtration up to four times in an eight-hour day. The conventional way — tank turnover once each hour — actually provides complete filtration of the solution only once in six hours.

Low-cost Honeycomb Filter Tubes last 6 to 12 weeks and can be renewed in a few moments. There's no maintenance cost between changes. And filtration starts again the moment new elements are inserted. There's no costly downtime while cake is built up. There are no plates, screens, bags, papers or filter aids.

Write for Bulletin GEO-505 for "A New Concept in Plating Filtration". Address Department PL.

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- Requires NO special tanks or equipment.
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- Won't injure rack coatings or work finish.
- Simple positive control.

Alkalume LC-1 is a specially developed immersion-type cleaner for removal of buffing compounds and soil from all metals, prior to plating or anodizing.

It is non-solvent, non-alkaline and not an emulsion. It has the desirable penetrating properties of both alkali and solvent yet affords complete protection for the surface finish.

Alkalume LC-1 is economical, non-toxic and non-volatile, offering long service life and no disposal problem.

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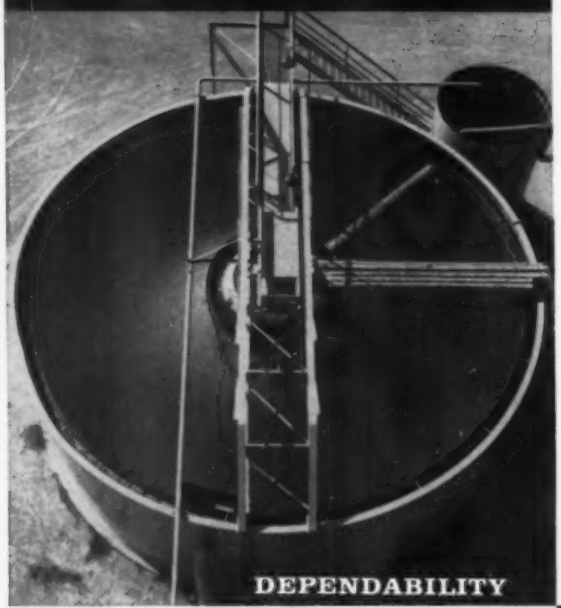

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SAVINGS in a TV antenna plant. Graver ion exchange system results in savings of $2,000 a month on plating operation through elimination of bath dumping. System restores original bath quality and provides for better rinsing.

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PRODUCT NEWS

PLATING SPECIALIST AT NEW LABORATORY (above) studies copper anode corrosion in transparent plating tank. Du Pont specialists are constantly searching for new ways to improve copper-plating techniques. (Left) New $2 million laboratory houses the latest plant-scale equipment to help insure practical solutions to production problems.

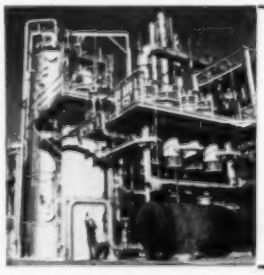
New Du Pont Laboratory helps solve customer problems ...researches new copper-plating processes

Plating problems are a major consideration at Du Pont's new Sales Technical Laboratory. Here, trained specialists use full-scale plating equipment to work out practical answers that can help you improve copper-plating quality, speed production, cut costs.

Research in plating techniques and processes is another important activity at the new lab. This continuing Du Pont research has resulted in a new high-speed cyanide process for bright-copper plating on steel parts and zinc die castings. This new process has been thoroughly field-tested, and is producing high-quality results on such parts as automobile bumpers and grilles, hardware products and wire.

Another Du Pont development now undergoing tests and refinements is a new technique for plating level copper on polished-steel parts. This new process promises to eliminate unracking, buffing and cleaning prior to nickel and chromium plating on many different types of parts. The level-copper process holds considerable promise for the plating of zinc-base die castings for smoother, more uniform deposits with excellent hiding power.

Ask your Du Pont Technical Representative for more details about these new plating developments resulting from Du Pont research, or about any of the products on the opposite page.

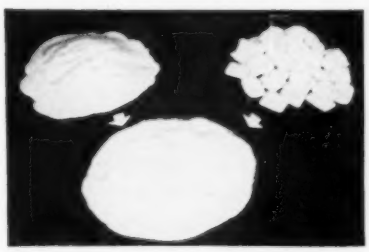


MODERN PLANT ASSURES DEPENDABLE SUPPLY OF QUALITY PLATING CHEMICALS

Du Pont plant at Memphis, Tenn., is now producing highest-purity sodium cyanide and potassium cyanide to meet your plating requirements. Example: Du Pont potassium cyanide is 98% minimum pure with .0003% maximum sulfides (as sulfur). You can order mixed shipments . . . save time, money, storage space.

FOR BETTER COPPER PLATING

Du Pont research results in Copper-Plating Chemicals that help you speed production, improve quality



Pre-mixed for your convenience —unique Du Pont double salt

This new salt developed by Du Pont combines high-purity Du Pont Cyanobrik® sodium cyanide and copper cyanide into *one* convenient copper-plating chemical for both bath make-up and replenishment. It saves time, cuts down handling of chemicals for greater safety, reduces errors because ingredients are already in the proper proportions required by bath.

SPECIFICATIONS

Copper	28.7% min.
"Free" sodium cyanide	0.4% to 2.0%
Lead	7 ppm. max.
Sulfides as sulfur	10 ppm. max.
Insolubles	0.01% max.

TYPICAL ANALYSIS

Copper	29%
"Free" sodium cyanide	1%
Lead	Less than 1 ppm.
Sulfides as sulfur	Less than 5 ppm.
Insolubles	0.01%

Du Pont Copper Cyanide— regular plating tests insure quality

With Du Pont Copper Cyanide your benefit is in low unit costs that result from savings in time, labor and overhead charges. For example, Du Pont Copper Cyanide readily dissolves in cyanide solutions without introducing inert salts into the plating bath. In addition, you get faster plating with high current density and rapid metal deposition.

Du Pont guarantees a copper content of 70.0% min. and a cyanogen content of 28.5% min. As a further guarantee of the quality of Du Pont Copper Cyanide, regular plating tests are conducted by Du Pont to insure maximum performance.

Du Pont Cyanobrik® now guaranteed 97% min. sodium cyanide

New high-purity "Cyanobrik" sodium cyanide specifications guarantee a higher minimum cyanide content, which can result in a lower net cost for your active cyanide. Automatically, maximum permissible impurities are lowered. This means that you get a full extra pound of active cyanide per 100 lbs. of "Cyanobrik."

You can count on the uniform high quality of "Cyanobrik" for even the most critical plating jobs. The negligible sulfide content makes Du Pont "Cyanobrik" particularly suitable for use in sulfide-sensitive electrolytes, such as proprietary bright-copper baths.

SPECIFICATIONS

Sodium cyanide	97% min.
Sodium chloride	0.2% max.
Sulfides (as sulfur)	0.0005% max.

TYPICAL ANALYSIS

Sodium cyanide	97.5%
Sodium hydroxide	0.4%
Sodium carbonate	1.5%
Sodium formate	0.35%
Sodium chloride	0.1%
Water	0.15%
Sulfides (as sulfur)	0.0004% (4 ppm.)

Drum head comes off quickly with a few turns of a wrench.

Easy-opening, reclosable drums simplify handling of "Cyanobrik" sodium cyanide

Both 100- and 200-lb. net steel drums for "Cyanobrik" sodium cyanide are nonreturnable open-head steel drums. A few turns of a wrench open the drum. It closes just as easily, giving full protection to partially used contents during storage.

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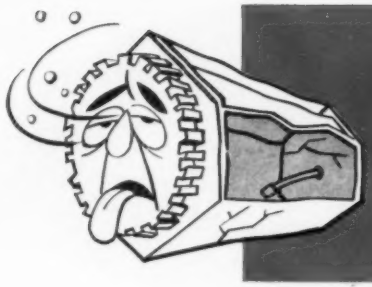

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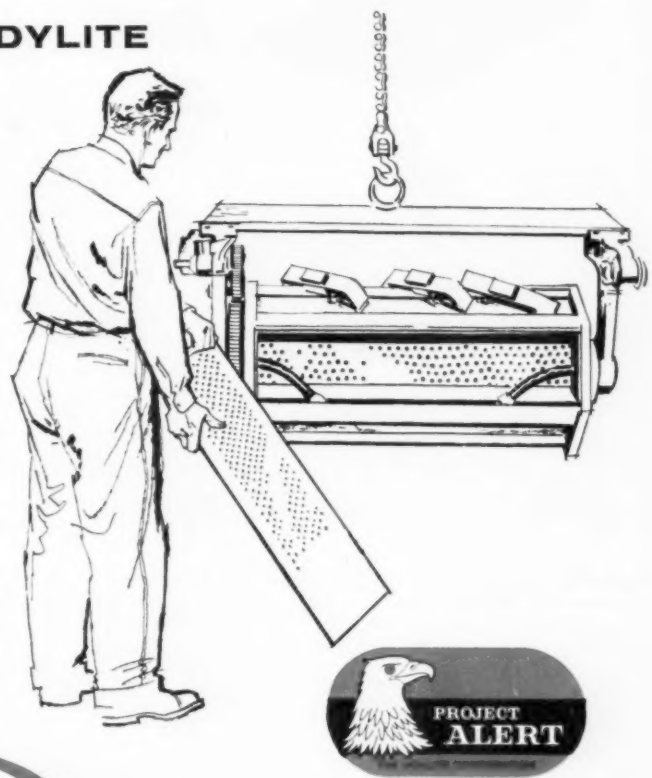

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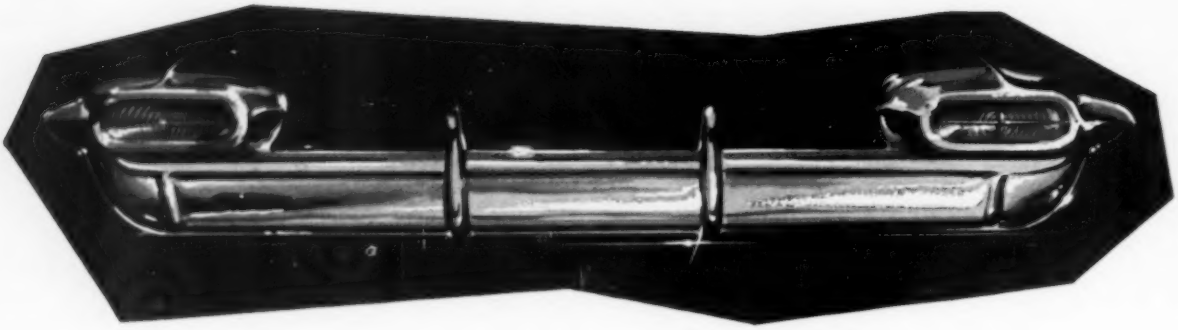

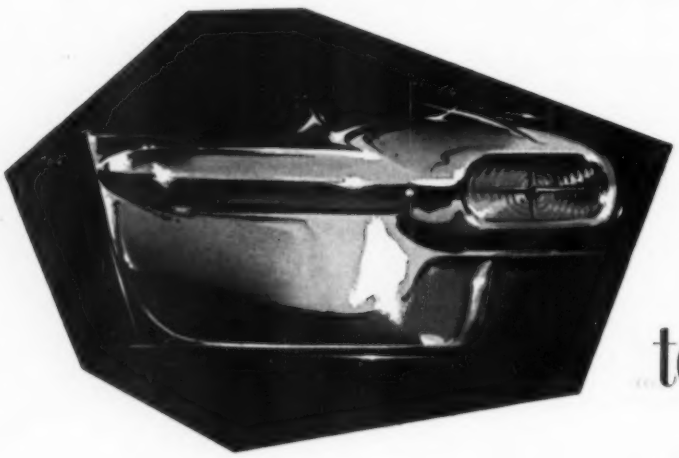

Acme designs custom setups to volume-finish difficult shapes

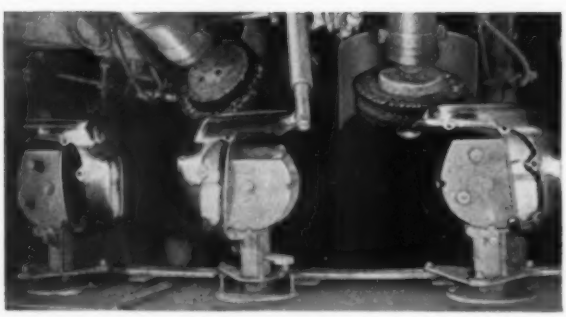

Photo shows three of twenty-one operations on Acme machine for finishing all contours of auto bumper part. At each station, part is automatically positioned and buffed by 20-hp floating-head lathe.

Polishing or buffing difficult contours on a volume basis can only be a successful and economical operation when the equipment is designed for the job—by experts. That's why, for nearly fifty years, manufacturers have turned to Acme-designed equipment.

Skilled Acme engineers receive the problem-product and, with *standard* units and a wide variety of accessories, design a *custom* machine to do the complete job. Each model change brings new challenges, yet much of the Acme equipment can be used year after year.

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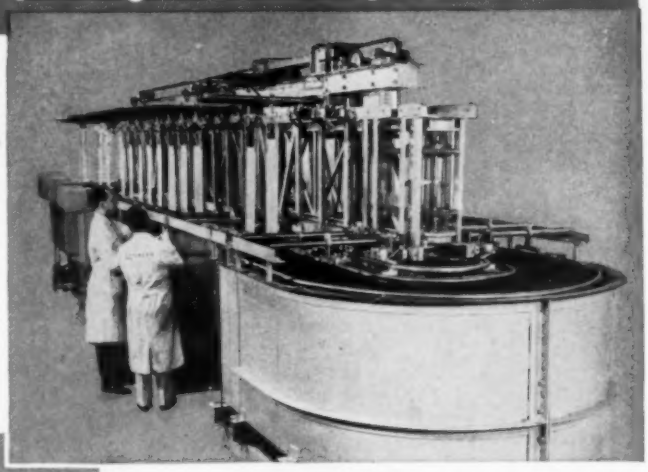

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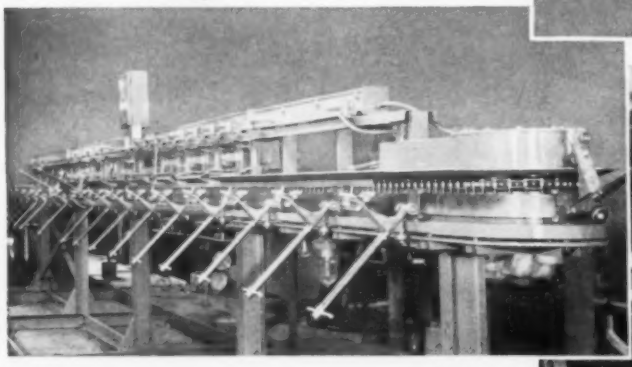

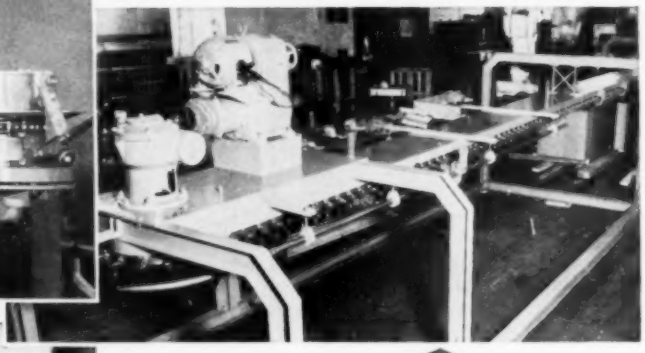

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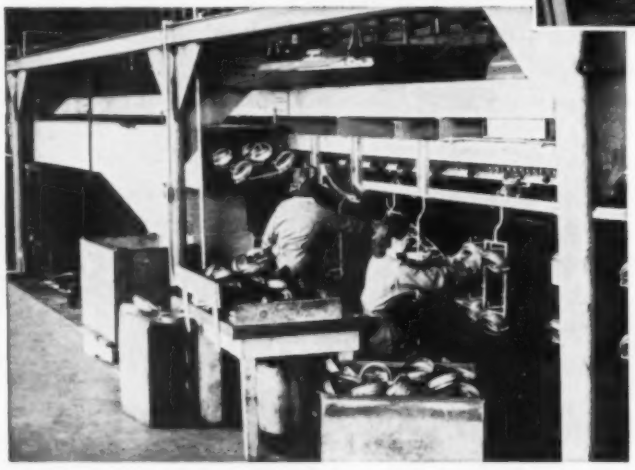

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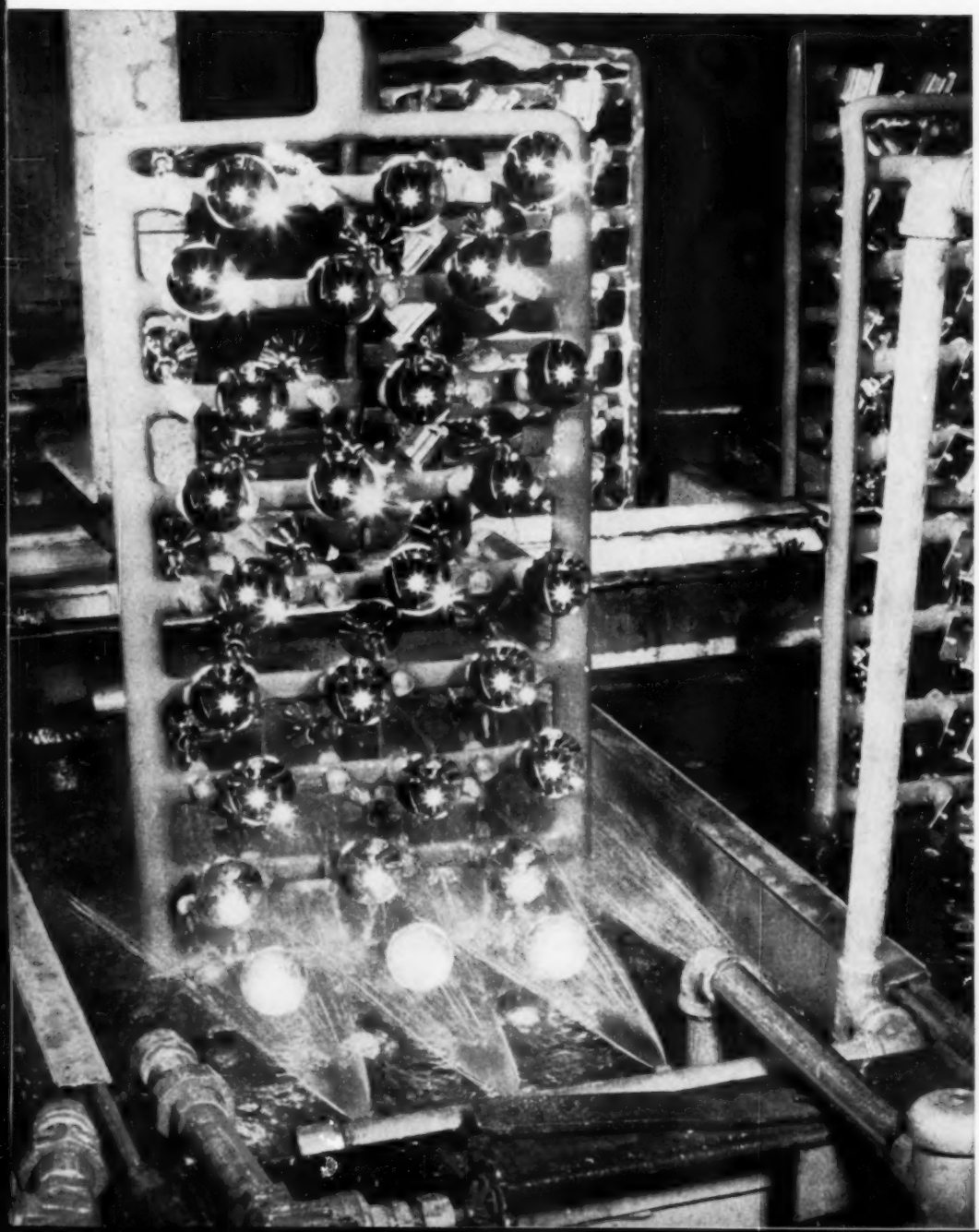

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Specification and Tests for Electrodeposited Metallic Coatings 1958, Compilation of Standards of Committee B-8. 124 pages, Paper Cover, 6 x 9", nonmembers $2.25, members $2.00.

These ASTM Standards, Sponsored by the American Society for Testing Materials and the American Electroplaters' Society, cover such materials as electro-deposited zinc, cadmium, nickel, chromium and lead for steel. In addition, coatings for copper, copper base alloys, zinc and zinc base alloys are also covered. This 1958 edition supersedes the previous issue in 1955.

Local thickness, acetic acid, and salt spray tests are included in this volume. Recommended practices for preparing metals for plating are included. These include plating for low carbon steel, high carbon steel, aluminum alloys, zinc base die castings, iron castings, etc. Tentative recommended practice for cleaning metals prior to electroplating is an informative portion of the compilation.

In all, the book contains seven specifications, three methods of test and nine recommended practices. Of the total 19 standards, five are new, recently revised or have had their status changed within the year.

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An Engineering Study of Vacuum Metallizing. University of Denver for U. S. Army Ordnance Corps., 32 pages. Order PB 131542 directly from Office of Technica Services, U. S. Department of Commerce, Washington 25, D. C., $1.

Thick deposits (0.001 in.) of cadmium, zinc, lead, silver and copper can readily be applied to metallic specimens by vacuum evaporation through use of a tantalum-boat type of heating source, according to this report of Army-sponsored research.

The object of the research was to determine the feasibility of using the economical vacuum metallizing process in lieu of electroplating for coatings on ordnance material, with emphasis on the application of the process to electrical components. The process has been used extensively for the rapid production of extremely thin metallic films on glass, metals and plastics.

Among other results, it was shown that aluminum, chromium, titanium, and nickel can be deposited in thin coatings (to 0.0001 in.) by use of tungsten wire filaments.

Multiple strands of tungsten wire were used to produce thicker coatings, but difficulties arose concerning the high temperatures required and the tendency of the charge metals to alloy with the filament material.

Thin Metal Films as Corrosion Indicators. by R. B. Belser and F. E. Hankinson, Georgia Institute of Technology for Wright Air Development Center, U. S. Air Force. May 1958. 98 pages. Order PB 131894 directly from the office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., $2.25.

This study was aimed at filling the need for a sensitive, easily inspected, economical corrosion indicator which would integrate, with respect to time, the total exposure of packaged material to corrosive conditions. An intensive examination of the corrosion properties and rates of iron and manganese films and of the bimetal pairs iron-copper and iron-gold is described. It disclosed the important role in metal film corrosion of the adsorbed gas layer normally present on glass substrates. This layer furnished oxygen necessary for small particles of the oxides of iron to form at random sites on the film. These subsequently became elements of electrolytic cells, and destructive oxidation of the film proceeded by electrochemical processes. Among other observations, it appeared that control of corrosion rates of iron films under specific conditions of temperature and humidity is feasible by control of the adsorbed gas layer and by introduction of cathodic particles, either as oxides or as small volumes of a more electrically positive material.

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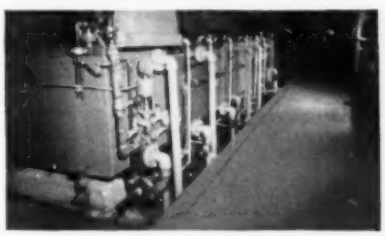

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CADMIUM EMBRITTLEMENT OF HIGH STRENGTH STEELS AT ELEVATED TEMPERATURES

by BENNIE COHEN*

INTRODUCTION

CADMIUM COATINGS ARE WIDELY USED on aircraft steel parts, primarily for the purpose of corrosion prevention. Recent brittle failues of aircraft parts have been attributed to cadmium-plated high strength steel being accidentally heated to near or above the melting point of cadmium. It is generally assumed from actual field experience that highly stressed, high strength steel in the presence of cadmium metal at or above its melting point is required for this type of embrittlement.

The embrittling effect of molten zinc on stressed steel has long been known.[1] Federal Specification QQ-Z-325 covering Electrodeposited Zinc states that zinc shall not be used on steel parts which in service reach a temperature of 700F or higher, or come in contact with other parts which reach those temperatures. The embrittling effect of cadmium on stressed steel at elevated temperatures has been reported[2] only in a qualitative way.

The embrittling effect of molten zinc on stressed steel has been explained as dependent upon the solubility of iron in molten zinc. The grain boundaries of steel are points of high energy, causing excessive intergranular attack of the steel by molten zinc. The embrittling effect of molten cadmium on stressed steel cannot be as easily explained, since iron is regarded as being insoluble in molten cadmium[3].

Electroplating high strength steel with cadmium can also result in detrimental hydrogen embrittlement. The embrittling effect of molten cadmium must be distinguished from the hydrogen embrittling effect resulting from the electroplating process in order to get a clear picture of the resulting failures which occur in practice. The experimental work to follow was accomplished in order to get quantitative data on the embrittling effect of molten cadmium on stressed high strength steels. Two typical aircraft high strength steels were investi-

* Senior Project Engineer, Electrochemical and Corrosion Section, Protective Processes Branch, Materials Laboratory, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio.

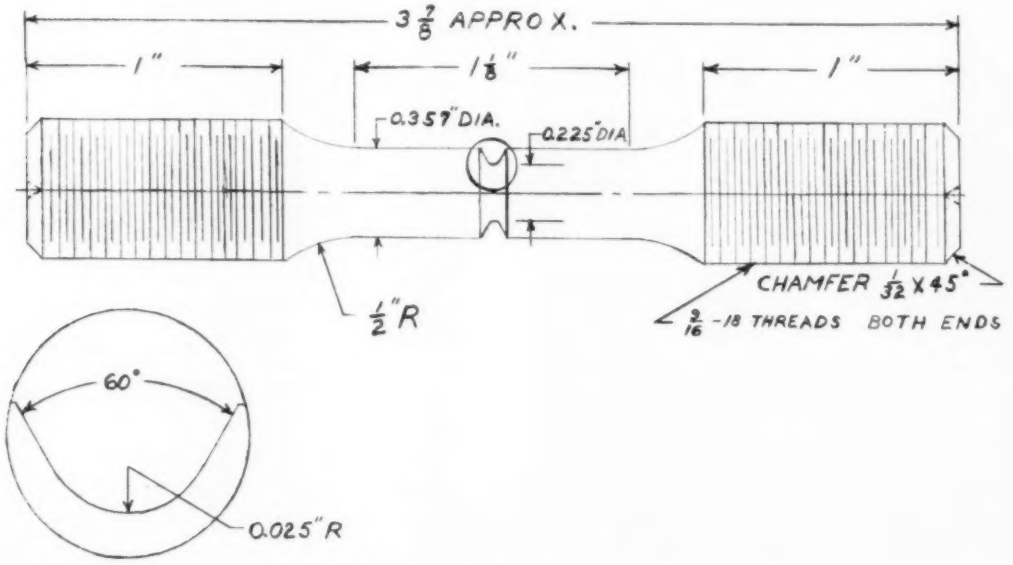


Fig. 1. Notched tensile specimen.

gated, SAE 4340 and SAE H-13 (chromium hot work tool steel).

EXPERIMENTAL—SAE 4340 STEEL

Specimen Preparation

Notched and plain gage specimens were fabricated from the same heat of SAE 4340 steel. The steel had the following chemical analysis:

C	Mn	P	S	Si	Ni	Cr	Mo
.39	.73	.012	.010	.25	1.74	.81	.24

The specimens were heat treated at 1575F for 1½ hours, oil quenched, drawn at 400F for 1½ hours, and air cooled. This treatment produced a hardness of Rockwell C-53 or approximately 280,000 psi ultimate tensile strength. The specimens were finish machined after heat treating. A drawing of the notched tensile specimen is shown in Fig. 1.

Room Temperature Tensile Data

Room temperature tensile data were obtained on both smooth and notched tensile specimens. The following data were obtained on smooth specimens.

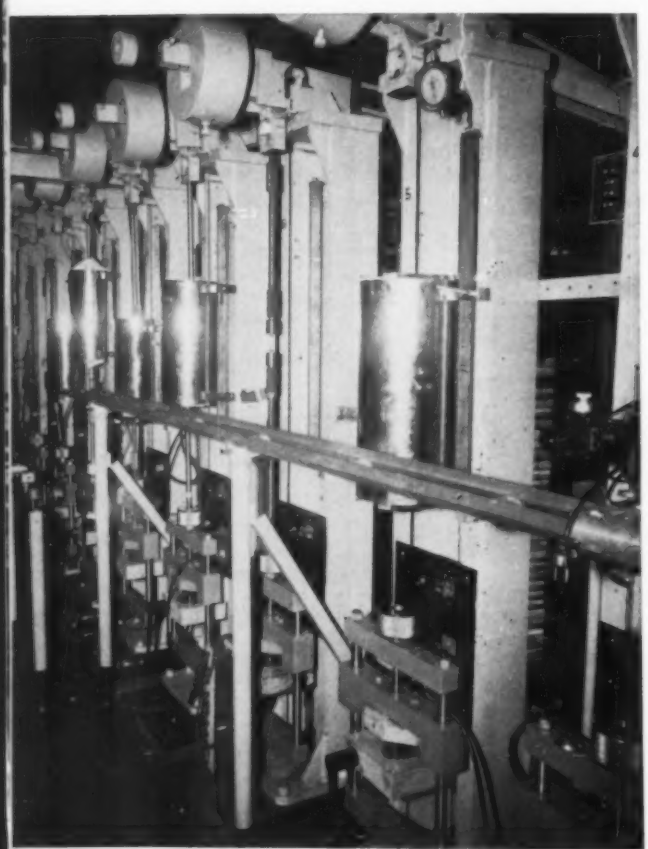


Fig. 2. Stress rupture machines.

TABLE I

PROPERTIES OF 4340 STEEL AT ROOM TEMPERATURE DETERMINED ON SMOOTH SPECIMENS

Specimen	1	2	3
Diam. (in.)	0.2244	0.2249	0.2250
Tensile Strength, psi	295,500	286,400	287,900
Yield Strength, psi	222,900	221,400	226,100
Reduction in Area	36.4	36.2	36.4
Elongation in 1 inch	11.5	11.5	11.0

The average ultimate notched tensile strength of the notched specimens was 430,000 psi. The ultimate tensile strength of a notched specimen is higher than that of a smooth specimen, owing to trixial loading effects in a notch.

Test Procedure

Constant-load, lever arm stress rupture machines were used for testing both the effect of molten cadmium and hydrogen embrittlement. This type test was selected because it is believed that it most closely duplicates the conditions under which actual failures had occurred in the past. This type test when used at room temperature has also been found to be the most sensitive test available for determining hydrogen embrittlement effects. The stress rupture machines used, equipped with automatic temperature controllers and timers, are shown in Fig. 2.

Four bare notched specimens were loaded at 220,000 psi at room temperature with no failure occurring after 400 hours. The load on the specimens was then increased to 300,000 psi for an additional 400 hours, with no failure occurring. Another specimen was loaded at 400,000 psi for 100 hours without fracture. All stresses on the notched specimens are based on the cross-sectional area at the root of the notch.

Cadmium Plating

All the notched and smooth specimens were electroplated with cadmium using the following procedure:

a. Degrease

b. Anodically clean in a proprietary electrocleaner for five minutes, at 72 asf, 180F

c. Rinse

d. Immerse in plating bath for one minute before applying current

e. Plate at 36 asf for 10 minutes

f. Rinse

g. Bake at 375F for 23 hours

A cadmium fluoborate plating bath having the following composition was used for plating the specimens:

Cadmium Fluoborate	240 g/l
Ammonium Fluoborate	90 g/l
Peptone (Difco Labs.)	1 g/l
*p*H	3.0

A photograph of bare and plated notched specimens is shown Fig. 3.

Four plated notched specimens were loaded at 220,000 psi at room temperature. No failure occurred after 300 hours of sustained load, which showed that no residual detrimental hydrogen embrittlement remained at the test stress level.

Elevated Temperature Testing

A testing temperature of 620 ± 10F was selected since this is slightly above the melting point of cadmium, which is 609.6F.

The specimens were first placed in test position as shown in Fig. 4 and were heated until a constant temperature of 620F was reached. The notched specimens, one unplated and five cadmium plated were tested using several methods of load application.

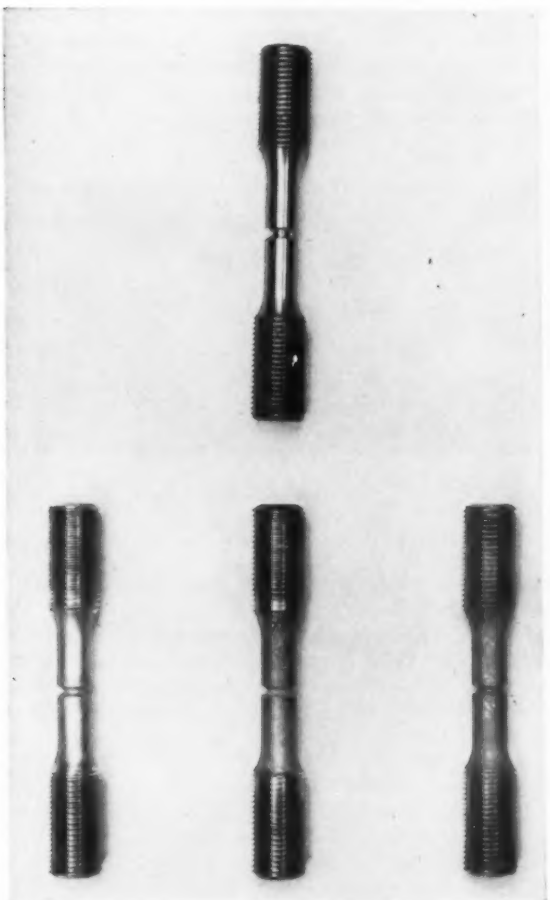


Fig. 3. (Top) Bare Notched tensile specimen. (Bottom) cadmium plated notched tensile specimen.

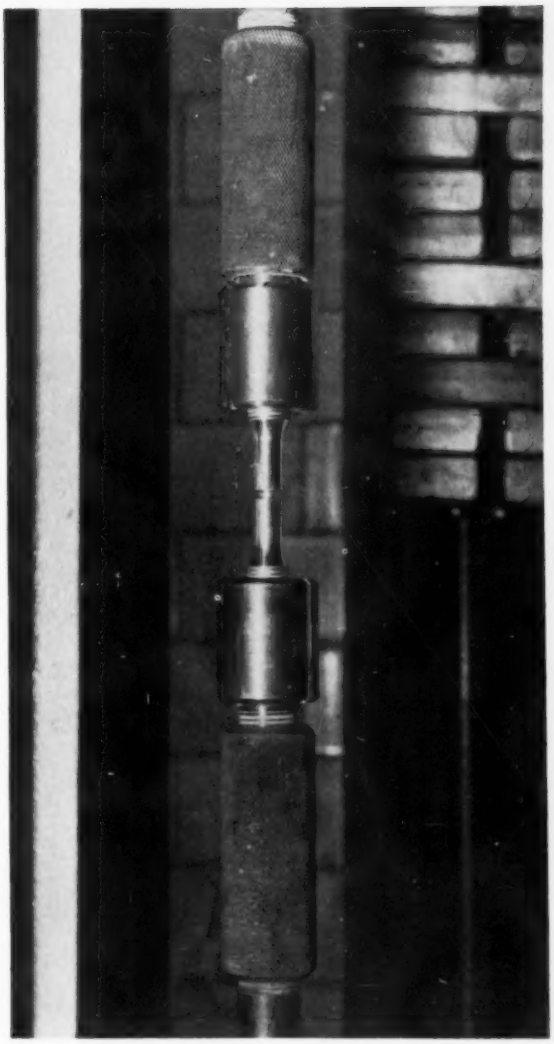


Fig. 4. Specimen in test position

a. Plated specimen No. 1, which was to be loaded to 200,000 psi, failed on loading at a stress between 120,000 and 130,000 psi.

b. Plated specimen No. 2 failed in approximately one minute upon application of 100,000 psi load.

c. Plated specimen No. 3 failed on loading to 100,000 psi load.

d. Plated specimen No. 4 was loaded at 60,000 psi and the load was increased 10,000 psi every 15 minutes. The specimen failed when the stress level reached 110,000 psi.

e. Plated specimen No. 5 was tested at 600F under an initial stress of 60,000 psi which was increased every 15 minutes by 10,000 psi. The specimen failed after a stress of 130,000 psi has been applied for 8 minutes.

f. Unplated specimen No. 6 was tested at 620F under a stress of 160,000 psi. The test was discontinued after 1000 hours since no failure occurred.

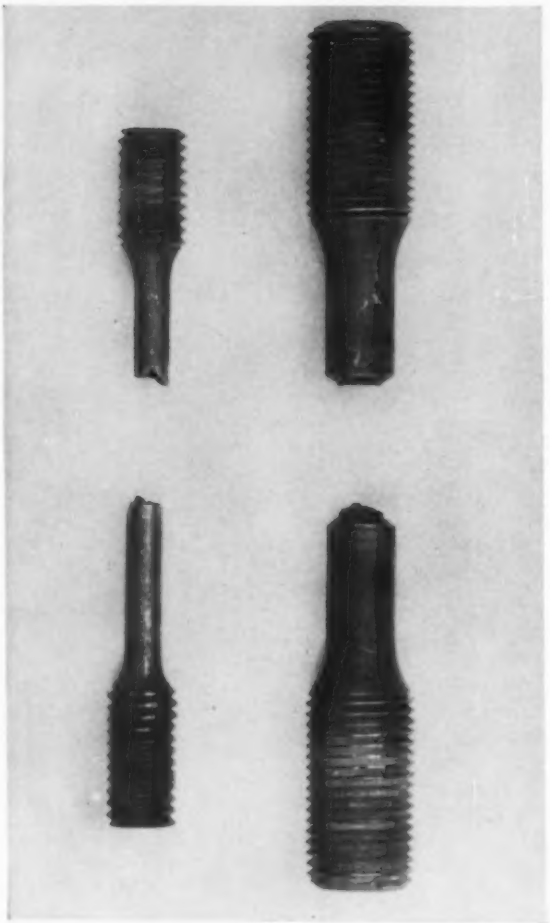


Fig. 5. Longitudinal view of fractures, cadmium plated 4340 steel. Test temperature 620F.

The plain gage specimens, one unplated and 3 plated, were tested at 620F with the following results:

a. Plated specimen No. 1 broke upon loading when a stress level of 173,000 psi was reached.

b. Plated specimen No. 2 failed in 0.4 hours under a stress of 150,000 psi.

c. Plated specimen No. 3 was held at a stress of 130,000 psi for one hour at 611F with no failure.

d. A short time elevated temperature tensile test was conducted on unplated specimen No. 4 at 620F with the following properties being obtained:

Tensile Strength	189,200 psi
Yield Strength (0.2% offset)	130,000 psi
Elongation in 0.75 inch	13.3%

EXPERIMENTAL—SAE H-13 STEEL

Specimen Preparation

Notched tensile specimens were fabricated from the same heat of SAE H-13 steel. The chromium hot work tool steel, Thermold J, was obtained from Universal-Cyclops Steel Corporation. The steel, obtained as ¾ in. round bar, Heat No. 19207, had the following chemical analysis.

C	Mn	Si	S	P	Cr	V	Mo	Ni
0.52	0.35	1.09	0.007	0.027	5.08	0.99	1.40	1.53

The steel was heat treated by heating at 1800F for one hour, aircooling, and double tempering at 1000F for two hours each. The specimens were rough machined prior to heat treatment and then finish ground after heat treatment. The notched tensile specimens, Fig. 1, were identical with those used for the study of the SAE 4340 steel.

Room Temperature Tensile Data

Two smooth and two notched tensile specimens were tensile tested with the following results.

Specimen	UTS	YS	UTS	%RA
Smooth	285,800 psi	253,100 psi		39.5
Smooth	280,800 psi	226,700 psi		37.5
Notched			416,200	7.6
Notched			429,800	5.5

These specimens were also tested to see if residual detrimental hydrogen embrittlement occurred as a result of the cadmium plating process, which was identical to that used for the SAE 4340 steel.

Three bare notched tensile specimens were loaded at 300,000 psi. A higher load was used here than that used for the SAE 4340 steel since the Thermold J was tempered at 1000F while the SAE 4340 steel was tempered at 400F. It was assumed that the 620F test temperature would have no appreciable effect on the mechanical properties of the Thermold J steel. The three specimens sustained the load for 400 hours with no failure occurring.

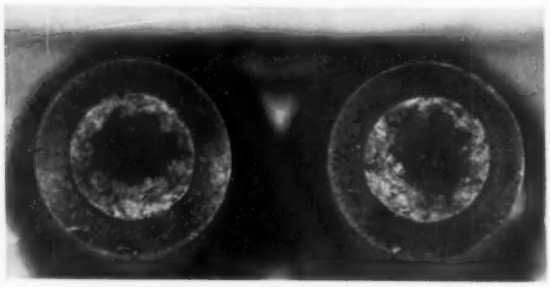


Fig. 6. Cross sectional view of fracture, cadmium plated 4340 steel. Test temperature 611F.

Three cadmium plated specimens were next loaded at 300,000 psi. These specimens sustained the load for 237 hours with no failure occurring. This showed that no residual detrimental hydrogen embrittlement remained at the test stress level.

Elevated Temperature Testing

Three bare notched specimens were heated to 620°F and pulled to failure with the following results.

	1	2	3
UNTS	390,000 psi	378,800 psi	386,500 psi

Four cadmium plated notched specimens were heated to 620°F and stress applied on the creep rupture machine. The

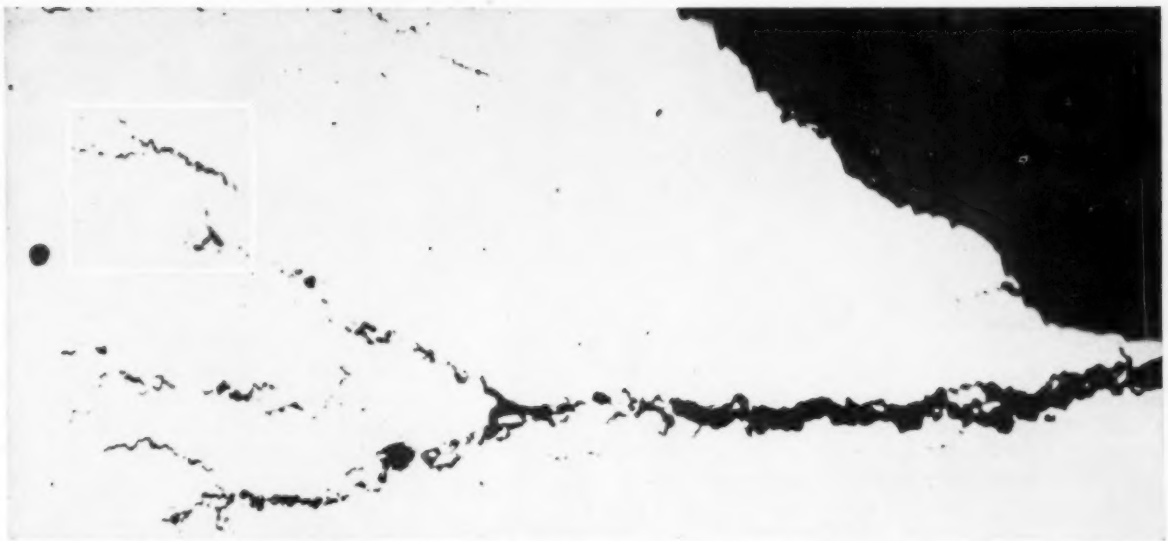


Fig. 7. Crack Propogation Across-Notch. Cadmium Plated 4340 steel. Magnification 150X (unetched). See Fig. 8 for above boxed area.

specimens all broke on loading. The following results were obtained.

	1	2	3	4
UNTS	180,000 psi	142,000 psi	160,000	60,000

Three cadmium plated notched specimens were heated to 600°F, or slightly below the melting point of cadmium, and pulled to failure with the following results.

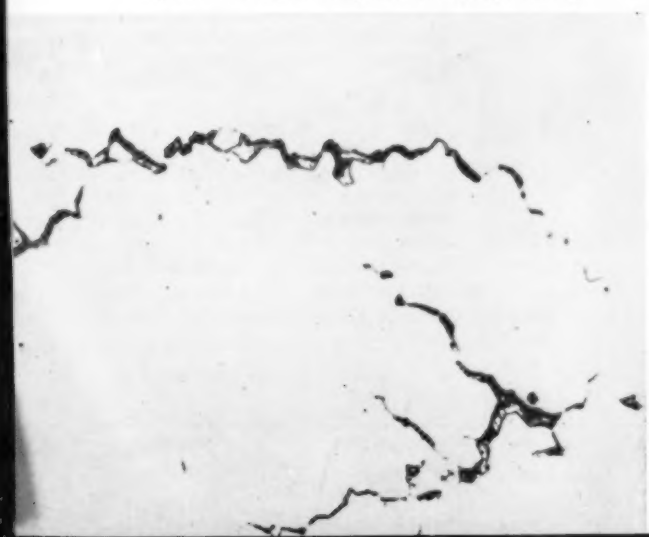
	1	2	3
UNTS	351,300 psi	340,900 psi	342,700 psi

DISCUSSION OF RESULTS

It can easily be seen from the results obtained that cadmium drastically reduces the tensile strength of high strength steels when the temperature exceeds the melting point of cadmium. The embrittling effect of molten cadmium is instantaneous, resulting in an extremely brittle type failure. A photograph of fractured brittle tensile specimens is shown in Fig. 5.

The SAE 4340 steel, having an ultimate tensile strength of approximately 285,000 psi, had an average ultimate notched tensile strength of 430,000 psi. The bare steel sustained a load of 400,000 psi for 100 hours at room temperature. The plated steel sustained a load of 220,000 psi for 300 hours at room temperature. The steel had a tensile strength of 190,000 psi at 620F, which would make its ultimate notched tensile strength considerably higher at this temperature. The steel was also capable of sustaining a load of 160,000 psi for 1000 hours at 620F. Yet when the melting point of cadmium was exceeded the ultimate notched tensile strength of the steel was reduced to the order of 100,000 psi. Although the degree

Fig. 8. Cadmium penetration into grain boundaries cadmium plated 4340 steel. Magnification 600X (unetched).



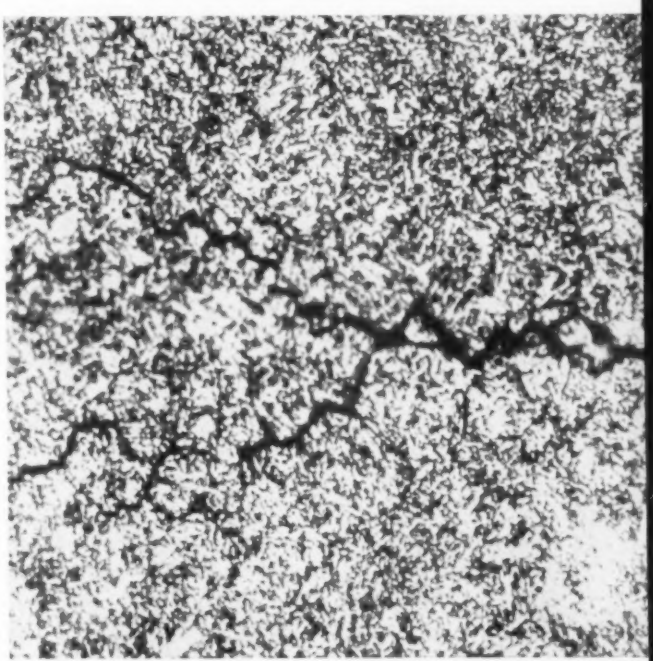


Fig. 9. Intergranular cracking of cadmium plated SAE 4340 steel. Test temperature 620F. Etchant 4 per cent nital. Magnification 875X.

of reduction for the smooth specimens was not as great as for the notched specimens, it was still significant.

The embrittling effect of molten cadmium is more clearly seen on the chromium hot work tool steels, since the steel was tempered at 1000F. The testing temperature alone had no significant effect on the tensile strength of the steel.

The SAE H-13 steel, having an ultimate tensile strength of approximately 285,000, had an average ultimate notched tensile strength of 423,000 psi. The bare steel sustained a load of 300,000 psi for 400 hours at room temperature. The cadmium plated steel sustained at load of 300,000 psi for 237 hours at room temperature. The bare steel had an ultimate notched tensile strength of 380,000 psi at 620F. Yet when the melting point of cadmium was exceeded the ultimate notched tensile strength of the steel was reduced to the order of 150,000 psi with one specimen breaking at a stress of 60,000 psi. The drastic drop in tensile strength was not obtained until the melting point of cadmium was reached since the plated specimens sustained a load of 350,000 psi at 600F.

It is evident that molten cadmium will drastically embrittle stressed high strength steel particularly at points of stress concentration. It is also evident that cadmium plated parts should not be specified for use at temperatures approaching the melting point of cadmium. This work was performed to show the results if cadmium plated parts become accidentally overheated and to show the danger of using cadmium plated parts in areas of elevated temperatures, especially on aircraft.

The mechanism of this embrittlement phenomenon is not self-evident. The fact that cadmium actually penetrates the stressed steel can be easily shown. A photograph showing the massive penetration of cadmium into the fracture zone is shown in Fig. 6. A photomicrograph showing crack propogation across the notch is shown in Fig. 7. It was taken along the longitudinal axis of the specimen. A small fragment of the crack is shown in Fig. 8. This shows clearly the penetrating power of molten cadmium into the steel. The intergranular cracking and the martensitic structure of the steel are shown in Fig. 9.

Since iron is not soluble in molten cadmium, the embrittlement which occurs cannot be logically attributed to an alloying effect. A photomicrograph of a galvanized (zinc) coating[4] formed by immersing sheet steel for ten minutes in molten zinc at 840F gave no evidence of intergranular penetration of zinc or cracking of the steel. This absence of intergranular attack on unstressed annealed steel could also be inferred for molten cadmium. The mechanism of both cadmium and zinc embrittlement cannot therefore be explained by a simple alloying effect.

An embrittlement mechanism is proposed as follows, for high strength steel, in three steps.

a. Stressed high strength steel deforms at grain boundaries, leading to a higher concentration of dislocations, while in annealed steels, the stresses are absorbed within the grains. This effect would be most pronounced at areas of stress concentrations or notches.

b. Molten cadmium, being in a state of high activity, very rapidly diffuses into the dislocated grain boundaries.

c. The molten cadmium in the grain boundaries interrupts the continuity of the structure and produces a condition known as "hot shortness". This results in intergranular cracking of the steel.

Conclusion

The significant conclusion reached as a result of this work is that cadmium coatings should not be used on high strength steels that are to be subjected to elevated temperatures. An amendment to Federal Specification QQ-P-416a, Plating, Cadmium (Electrodeposited) has been written which reads, "Cadmium coatings shall not be used on parts which in service reach a temperature of 500F or higher, or come in contact with other parts which reach those temperatures." This restriction is also included in Specification MIL-C-8837 (ASG), Coating, Cadmium (Vacuum Deposited).

ACKNOWLEDGMENTS

The author would like to acknowledge the assistance of Mr. W. H. Rector who performed the stress-rupture tests and Lt. J. R. Myers who prepared the metallographic specimens and collaborated on the metallurgical interpretations.

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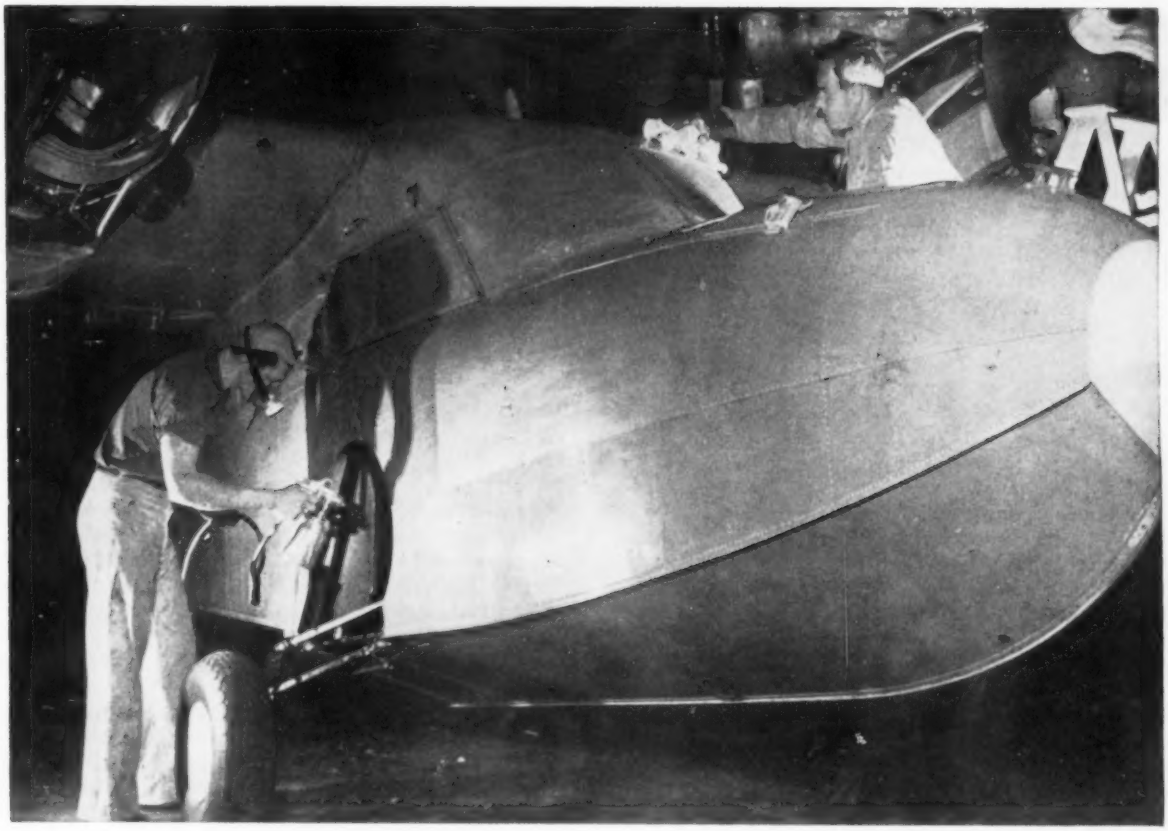
Bennie Cohen graduated from Mississippi State College in 1948 with a BS degree in Chemical Engineering. During 1950–1951 he did graduate work in Chemical Engineering at the University of Cincinnati. Mr. Cohen is presently continuing his Chemical Engineering graduate studies at Ohio State University. From 1948 to 1950, he was a Chemical engineer with the U. S. Engineers. Since 1951, he has been senior project engineer with the Electrochemical and Corrosion Section, Materials Laboratory at the Wright Air Development Center. Mr. Cohen is a member of ASTM Committee B-8 and 1st vice president of AES Dayton Branch.



Photograph Courtesy of Grumman Aircraft Corp.

AIRCRAFT FINISHING

by **NORMAN I. GAYNES***

THE ORGANIC FINISHING OF AIRCRAFT is indeed one of many ramifications and diversities made even more complicated by the supersonic requirements of coating performance.

Military specification developments for dopes, lacquers and enamels have been the vanguard of most aircraft finishing products. They have proved so successful that even where civilian aircraft are involved, the manufacturers for the most part have found it expedient to retain government specification paint products for finishing of airplanes.

The planes of early vintage were predominantly of the fabric type. This, of course, required the use of fabric coatings. Nitrocellulose or pyroxalin "dopes" answered the call very successfully. This particular product had an increased value in that in addition to its excellent quick dry coating properties the dope also contributed a tautening and strengthening effect on the fabric. Government specifications[1,2,3,4] while not as widely used as formerly are still quite in evidence today.

More recently a newer development in coating technology has been used to supplement the utilization of dopes on fabric planes. Coatings based on cellulose acetate butyrate[5,67], have in many areas replaced the nitrocellulose variety. One of the more prominent small plane producers uses the "CAB" exclusively on his cub planes. The procedure consists of spraying the fabric with water to remove any and all wrinkles. A tinted transparent CAB dope is applied using the hot spray method at temperatures of 120 to 150F until a film thickness of 3.25 to 3.75 mils is obtained. This may require about three cross coats in order to yield the desired film. An aluminum pigmented CAB lacquer is then applied to a dry film thickness of 0.5–0.6 mils which is water sanded after the coating has dried sufficiently. The final topcoat, which is a color pigmented gloss CAB dope with a final thickness of approximately 1.5 mils, is applied by hot spray. Subsequent rubbing and polishing completes the operation.

The advent of metal planes of the aluminum and duralumin types introduced the need for newer finishes to provide protection against corrosion influences. The normal

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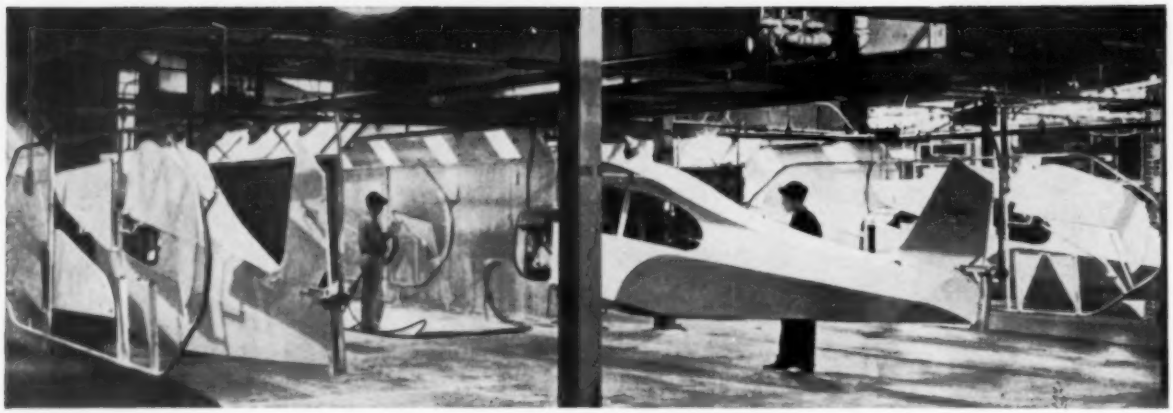

Finishing department at the Aeronca plant

anti-corrosion primers such as red lead and red oxide were completely impractical in that heavy buildups are required to afford adequate protection from attack. Unnecessary heavy paints provide a drag on the plane and reduce the ultimate speed of the plane. Zinc chromate pigment[8,9] incorporated into a primer provides chromate ions in a finishing system which tends to passivate the metal against corrosion. Another advantage of this particular product is its required film thickness. In contrast to the lead and oxide primers only a thin film in the amount of 0.3 mils is required or desired. Greater film thicknesses actually prove deleterious to the whole system.

ADHESION

The adhesion of primer to the metal substrate becomes an important facet of aircraft finishing, for without adequate adhesive forces between paint and metal no primer can function efficiently as a protective agent. Many methods have been devised in the past for improving adhesion, most notably those of the phosphate or surface conversion type, which in addition to providing a strong bonding base also deposit an insoluble phosphate for increased corrosion resistance.

Where facilities for phosphate pretreatments were limited, a new product was developed to produce similar results. In the early 1940's the WP-1 wash primer or metal conditioner[10, 11] based on alcohol soluble vinyl butyral resin, basic zinc chromate, water and phosphoric acid were formulated in a balance to provide an insolubilized protective adhesive deposit.

Anodizing or depositing of a gelatinous oxide protective film on aluminum or other light metals is another method used to promote adhesion. Here the metal is placed at the positive or anode position in an electrolytic bath of the acid type such as sulphuric, chromic, boric etc., and current allowed to flow thru the cell. The hydroxide is first formed but the action continues until the oxide remains.

At this point it might be well to point out a rather increased confusion and misunderstanding which arises constantly on the subject of metal pretreatment and primers. Anodizing, as we have just pointed out, is a process of electrolytically depositing an oxide surface. A similar sounding name, Alodizing, is used for a proprietary phosphate treatment applied by non-electrolytic processes. The names should not be intermixed or confused. If the surface is anodized or oxide coated, a wash primer is desired. In this case the material penetrates the porous oxide and establishes a firm bond. In the latter case, however, the phosphate treatment has already established an insoluble phosphate coating. Application then of a wash primer over an already phosphated surface is completely useless and wasteful. In fact, the phosphoric acid in the wash primer, with no place to go and no metal to react with, will actually in most cases destroy the paint film system. This differentiation should always be recognized.

The most satisfactory and widely used topcoat for aircraft for the longest period of time has been the nitrocellulose lacquer. This has produced the necessary protective features and reduced the visibility of military planes from the ground. Various improvements over the years have of course been made from the original lacquers until now those based on a coconut oil alkyd[12,13] in combination with nitrocellulose, are accepted as standard where good resistances to gasolines, oils, and low water sensitivity are required.

More advanced aircraft require more advanced finishes. Thus where resistances to diester lubricants has been required it was necessary to develop the acrylic resin modified nitrocellulose lacquer.[14,15] This may prove to be an interim product as the requirements for lubricant resistances become more demanding.

The application of both the coconut alkyd lacquer and the acrylic lacquer affords a study in contrasts. The normal system used for aircraft under the more conventional coconut alkyd lacquer requires a 0.2–0.3 mil coat of wash primer followed by a 0.3–0.4 mil coat of regular zinc chromate primer under specification MIL-P-6889A(Aero). The acrylic lacquer, however, must utilize another variation. As with the former the acrylic system also uses the wash primer but in order to develop full adhesion, a lacquer type zinc chromate primer[16] is required. Failure to use the lacquer type primer dooms the whole acrylic system to failure.

In some cases it may take two coats of coconut oil alkyd lacquer to develop the required 1.0 mil dry thickness. Aircraft enamels[17] may be used as a substitute for the lacquer in one coat application to obtain the desired 1.0 mil. Enamels have the additional advantage of better heat resistance, higher initial gloss and better resistance to diester lubricants. Enamels, however, do not dry as quickly as lacquers.

Commercially, the aircraft companies and airlines have found it necessary at times to deviate far afield from the established military specifications. For example, the commercial craft are interested in decorative effects in addition to many specialized maintenance problems. As a result,

epoxy-based amine-cured enamels are receiving wide attention. Polyurethane coatings are also becoming more prominent in this field. Both of these aforementioned products are ideal where chemical resistances to skydrol hydraulic fluids or polyglycol fuels are essential. The only disadvantage encountered is the catalyst required to adequately cure these coatings in order to develop maximum dry and chemical properties. These must be shipped in a separate package and when added to the liquid epoxy or polyurethane produces a limited pot life. Some one-package products, with virtually unlimited stability, are now being evaluated.

TITANIUM AGENTS

Another relatively new development which has received some attention in patent applications and development work has been the use of titanium organic esters and titanium chelates as cross linking agents on the free hydroxyl groups of the cellulose derivatives such as nitrocellulose and cellulose acetate butyrate. These products, while only in the development stage, have thus far shown extreme chemical resistance properties well exceeding those normally expected from the unreacted cellulose compounds.

The use of titanium metal in aircraft has produced increasing problems in organic finishing. Titanium is a very unreactive metal normally manufactured and fabricated with a hard oxide film which will not be affected by such strong etching acids as nitric or phosphoric. Thus phosphate treatments and wash primers have no effect and cannot be used to prepare the metal for coating. Normally only solutions containing hydrofluoric acid or its salts will have any results. A new method has been tried, and in some cases very successfully, to increase the adhesion of organic coatings to titanium. Dilute solutions of a titanium ester such as tetraisopropyl titanate in hexane when applied to the metal substrate, will be hydrolyzed to form a thin film of titanium dioxide. This film acts as an intermediate and improves the adhesion of subsequent topcoats.

FLUORESCENT PAINTS

While not a new idea, the use of bright fluorescent fire orange paints[18, 19] has received prominent notice in the nation's press. The clamor for more effective means of air safety has focussed the attention of officialdom in air circles on these paints as a means of obtaining increased visual sighting of aircraft travelling at jet speeds.

Some government contracts have been issued for this product, and many airlines have also hastened to adopt it. It consists of a three coat acrylic system, requiring first a white undercoat, the fire orange as the second, followed by a topcoat of clear sunscreen enamel. A 1–1.5 mil thickness of white is desired depending on the color of the surface being coated. The fluorescent paint is applied in a 2.8–3.2 mil thickness, with the ultra violet absorbing clear usually only 0.5–1.1 mils. A four-hour dry between each coat is required in order to provide optimum film properties.

There has been a serious drawback, however, in the use of these fluorescent type pigments. Most are sensitive to or soluble in active solvents such as ketones and esters. This reduces the possibilities of their use in nitrocellulose lacquers which require the use of these solvents to keep the nitrocellulose in solution. It does appear that a more intense interest will be evoked in the near future to further utilize the beneficial effects of extreme daylight visibility.

Much of the aircraft industry, though sometimes complicated, is standard and conventional in design and finishing requirements. However, as aeronautical technology advances, so too will the facilities of finishing laboratories be required to advance in order to keep pace with developments. For example, as the speed limits of planes is increased, the temperatures on the leading edges of the wings increases. In some cases these temperatures exceed 2000F. Finish formulators are challenged to develop coatings to withstand these and more elevated temperatures. This is just one of the many problems facing coating researchers.

It has been attempted here to show the accepted procedures and at the same time indicate some of the developments being studied and solved. Many of these are only a start in the anticipated problems of the fast approaching Space Age.

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Norman I. Gaynes received his Bachelor of Chemical Engineering degree from New York University and his Master's degree in Mechanical Engineering from the University of Cincinnati. He gained his knowledge of plating at Manning, Maxwell & Moore, Bridgeport, Conn. After nearly four years of Army service during the war, Mr. Gaynes was in charge of finishing with Conmar Products and later was with Maas & Waldstein. His experience in plating, and the application and development of organic finishes equipped him to act as a consultant to firms with finishing problems. Though he is now connected with Titanine Inc., Union, N. J. as technical director and specialist in aircraft finishes and multi-colored paints, consulting activities still claim a large portion of his time. He is a member of the Newark Branch, AES.

ELIMINATING "SKIN TROUBLE" AT GRUMMAN

by TOBY DELGIUDICE*

ABSTRACT

"Skin trouble" to the airframe aluminum finishing engineer is that condition on the surface of the alloy which interferes with obtaining a sound, uniform conversion coating. The problem was how to pour into a cleaning line an accumulation of all the contamination ills obtainable in forming, welding, handling, etc. and turn out uniformly clean, active aluminum surfaces acceptable to conversion coatings and maintain less than one per cent rejections.

Aside from soil-removal problems, the typical airframe manufacturer's problems remained: treating small releases of widely varied sizes of parts, disposal of spent chemical solutions in a waste-disposal conscious locality, and maintenance of large volumes of treatment baths.

As is usual in instances of manufacturing progress, the solutions to these problems were evolutionary.

INTRODUCTION

It was discovered early in Grumman's history that no one type of cleaning agent would satisfy all of the soil-removal requirements. In addition, intermittent cleaning of detail parts should lessen the final cleaning requirements prior to the conversion treatment. Actually, this assist is not substantial, but it is necessary (e.g. degreasing prior to heat treatment has become mandatory). All three types of chemical cleaning, or combinations of them, are used at one stage or another: organic (degreasing, cold solvent, etc.); alkaline (non-etchant type) and acidic (deoxidizer type). At Grumman, the acid type has evolved as the most versatile and the most consistent.

The types of soil encountered are common but are seldom mentioned. They are:

Baked on lubricants and forming compounds
Embedded foreign metals (steel, lead, etc.)
Identification inks
Heat treatment scale
Accidental (adhesives, hardened tapes, dried rubber particles, etc.)

Experience has shown that degreasing and non-etch cleaning are only marginally effective in removing these soils. Most degreasing fluids are similar in cleaning power, and of twenty-five proprietary non-etch cleaners investigated, none do for aluminum what high causticity cleaners do for steel. No non-etch cleaner satisfied all of the requirements demanded of it. Etchant alkalis are not considered due to the hazards present in rinsing fastened members, such as spot welded skins, and the danger of over etching. Acid cleaning has satisfactorily solved the problem to the extent that conversion treatment rejects are less than 0.75 per cent and hardly any hand cleaning is employed at all.

The common deoxidizers which actually only brighten aluminum surfaces and remove the natural oxide film, consist of chromates, bifluorides, acid sulfates, nitrates, phosphates, or combinations of these. They are usually operated at room temperature or, at slightly elevated temperatures. The dimensional change of parts exposed to these solutions for even an hour is negligible. They will strip conversion coatings but usually after long immersion times. For cleaning purposes a more active deoxidizer was developed at Grumman.

Theory of Acid Cleaners

Experiments were conducted in the passage of anions through the natural aluminum oxide coating.[1] It was reported that this ability is related to the size of the anion and influenced slightly by the presence of certain cations. The decreasing order of diffusivity is:

1. Chloride
2. Bromide
3. Iodide
4. Fluoride
5. Sulfate
6. Nitrate
7. Phosphate

Although the fluoride ion is the smallest, it forms complexes with aluminum which apparently affect its rate of penetration. Since phosphates form the least soluble aluminum salts, they are the slowest. Nitrates, being oxidizing agents, tend to reform the oxide while dissolving it, retarding its reaction with aluminum.

It follows that in considering the influence of the above anions, the anion which will penetrate fastest will be the most active. If the anion is a component of an acid, generation of hydrogen results (except for nitrates) which assists in lifing the oxide. Should the anion combine chemically to form soluble products, the activity of the acid will be further increased. On the other hand, the activity of the acid must be controlled to avoid the danger of indiscriminate attack. The choice of ions should be made such that there is a combination of a slow, inhibiting anion and a fast, activating anion in proper balance. By manipulating this balance, the degree of activity can be controlled.

*Process Engineer: Group Leader, Grumman Engineering Aircraft Corp., Bethpage, Long Island, N. Y.

Acid Cleaners at Grumman

Two cleaners are in use at Grumman. One is a combination of nitric acid and sodium sulfate. The other consists of nitric acid and ammonium bifluoride. The more effective solution is the former and shall be the only one discussed. The operating conditions of this bath are:

Nitric Acid (42° Baumé)	16–20% (vol)
Sodium Sulfate ($Na_2SO_4 \cdot 10\ H_2O$)	10–16 oz/gal
Temperature	170–175F
Time	4–8 minutes

The ratio of nitric acid to sodium sulfate should be 1.4–1.8 to 1. This range not only provides the desired activity but also prevents chemical deposition of dissolved metallic ions. Copper, in particular, will chemically deposit out on aluminum alloys in the fresh bath at a ratio of 1.4. At a ratio of 1.8, it will not. At 1.4 if about 1–2 g/l of dissolved aluminum is present, no deposition will occur. Work is being performed now to determine whether this is a simple relationship between single electrode potential and solution concentrations. The higher ratios are particularly important at the higher concentrations of sodium sulfate. Ratios below 1.4 tend to produce streaking and "frosting." Long treatment times result from ratios in excess of 1.8. The amount of material removed varies with the alloy. Five minute immersion times have resulted in the following metal losses at the above conditions.

7075 T6	290 mg/sq ft
2024 T4	240 mg/sq ft
6061 T6	220 mg/sq ft
2014 –alclad	180 mg/sq ft

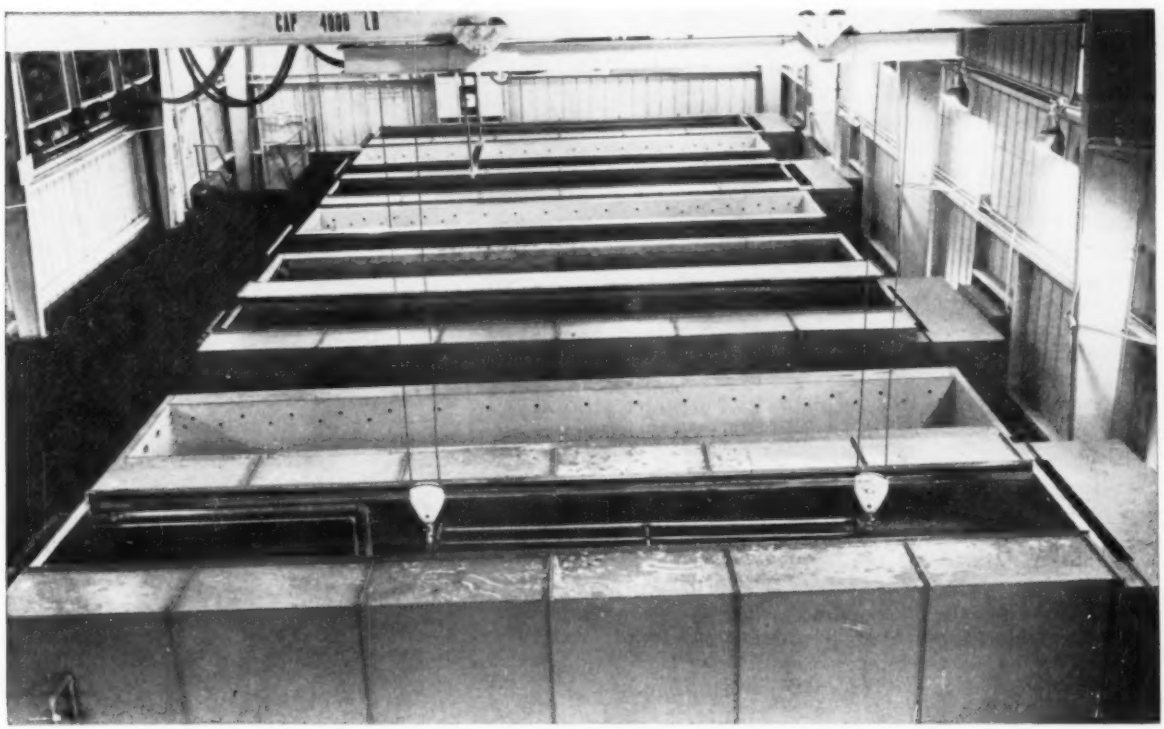
It is of interest to note that metal loss is directly related to alloy composition. Since oxide film weight is also related to alloy composition it would seem that the diffusion rate theory is valid. Metal loss also is proportional to temperature. The table below points out this relationship for 6061 T6.

Bath Temp. °F	Metal Loss (mg/sq ft)
100F	25.0
120F	52.0
140F	100.0
160F	180.0
180F	350.0
200F	600.0

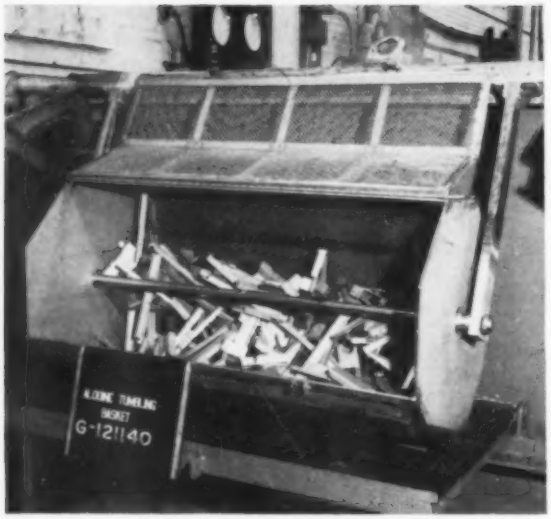
This relationship is particularly valuable in handling stubborn, baked in greases. High temperatures are quick to remove the contaminant.

Other advantages of this bath are that the copious nitrous oxide fumes evolved during the dissolution of aluminum destroy oils, and metallic contaminants, which must be skimmed from the surface of other baths. It is an inexpensive bath to maintain, contains no toxic waste, can be operated in a 316 stainless steel tank using a stainless steel hood and coils, is an excellent spot weld cleaner, can be easily replenished by taking advantage of evaporation losses and has lasted a year, or until there is about 10 gm/l of dissolved aluminum. The solution is not sensitive to contamination as is evidenced by its further use as a stripper for aluminum oxide coatings, and on occasion, chromate conversion coatings. Hard anodize racks are regularly cleaned up in the same solution.

The cycle which is used for pretreatment prior to anodizing,



Aluminum cleaning and chemical milling line



Small parts cleaning and tumbling basket.

hard anodizing and conversion coating processes such as Alodine No. 1200* is as follows:

Unit Description	Material of Construction
1. Non-etch alkaline cleaner Tank (160–180F) Foam depressed for agitation	Hot rolled steel tank, plain steel coils, air agitated
2. Cold-water rinse tank overflow dam (120F)	Hot rolled steel tank, air agitated
3. Nitric-Sulfate Acid Cleaner (Described above)	Vented, 316 ss tank, air agitated
4. Hot Air Dry (180–200F)	Recirculated hot air, filtered

Due to space limitations, only one rinse tank is used.

Most of the detail parts enter the cleaning department degreased but as is usually the case in large production facilities, a certain percentage of the parts are contaminated. Obvious errors are corrected at the degreaser and minor soils such as mill inks (red) are removed in the alkaline cleaner. At one time the heavy soils were cause for automatic rejection and returned for hand cleaning. Now, they are passed on and inspected after final cleaning.

The alkaline cleaner presently in use has evolved from a mixture of a soak and a spray cleaner which since has been marketed as a single material.** It is nonfoaming and is capable of removing certain red identification inks in 1–2 minutes. The black inks (These inks are allowed to remain on the parts during heat treatment and all fabrication steps until the part is ready for final finish.) used on bare 7075 alloys are not easily removed in the alkali cleaner but are dispersed in the acid cleaners.

The types of handling equipment in use are the basket, which is a little smaller than the inside dimensions of the tank, for small detail parts, such as stiffeners, angles, doublers, etc. and the overhead rack. The rack is simply a welded, channel frame from which hooks and springs are hung. Contoured, exterior skins are primarily supported by this rack. The basket is constructed of 316 stainless steel and is immersed in the baths. The hooks and springs are made of aluminum, or stainless steel, are immersed in the solutions but the racks is not. Submerged revolving baskets are filled with small stampings, fittings, rivets, etc. saving racking time.

*Product of Amchem Corp., Ambler, Pa.
**Product of Oakite Products, Inc., New York, N. Y.

SUMMARY

The need for added assurances in eliminating severe contamination problems required investigating other than the common solvent and alkaline cleaning systems. These systems are inhibited to the point that they become inadequate by themselves.

This need must be satisfied by a system which can, in its most active state, be controlled so as not to risk the destruction of the part. The cleaner should produce surfaces which are uniformly active, have long life, have a wide activity range, be easily maintained and operate economically.

The most satisfactory system evolved is the acid system. The particular system in use utilizes two anions which have relatively slow diffusivity rates at room temperature but can be accelerated considerably at elevated temperatures providing a wide range of activity. It has successfully eliminated the worst problems confronting it, consistently. At the point of its greatest activity the surface damage is not irreparable. Dimensional losses are at worst, 0.001–0.002 in. Indiscriminate etching is a gradual condition which can be remedied, before permanent damage results.

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Toby Delgiudice has headed up the inorganic process engineering section at Grumman Aircraft, Bethpage, Long Island, N. Y, since March of 1955. The section handles development and production support of plating, conversion coating and cleaning systems.

He had previously been associated with Jelco Finishing Equipment Corporation, New York City and Henry Levine & Son, Inc., New York City.

Mr. Delgiudice received a commission in the Navy in 1946 and was awarded a Bachelor's degree at Holy Cross College in naval science. In 1948, he continued his education at Queens College, New York City, receiving a BS in chemistry. Post graduate studies were conducted at Brooklyn Polytechnic Institute through the New York State Scholarship Program.

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A PRACTICAL APPARATUS FOR THE CONTROL OF LEAD-TIN ALLOY PLATING BATHS

by ROBERT L. GARRETT*

INTRODUCTION

THE ELECTROLYTIC METHOD for the determination of lead-tin alloy composition presented by DuRose and Hutchinson[1] is far superior to gravimetric determinations. However, the apparatus described has some limitations when used repeatedly over a period of time for continuous maintenance of production lead-tin baths.

This paper describes in detail an apparatus which has been used four years to help control lead-tin fluoborate plating baths in the plating shop of a major airline overhaul base. In this shop, hundreds of aircraft engine parts are processed each day using the 93–7 per cent alloy of lead-tin and the need for quick, frequent checks on the alloy being deposited gave the incentive to design and build the equipment described.

CATHODE

The most important part of the device is the cathode itself. The masking process described in the DuRose and Hutchinson paper is awkward and after several uses becomes inadequate. It is impossible to mask 1/16 inch on each side of a steel panel, using the mask several times, and not have a certain amount of plate "bleed under." Since the area of the cathode is important in the calculations, the idea of a cathode without edges took form first in a spherical shape. This was later modified into the cylindrical shape with hemispherical ends. Also, the original cathode was fastened to the stem by a threaded connection. This point could not be sealed tightly with the result that plating solution eventually etched the inside of the cathode. The present form of cathode was finally developed and has worked satisfactorily for over three years.

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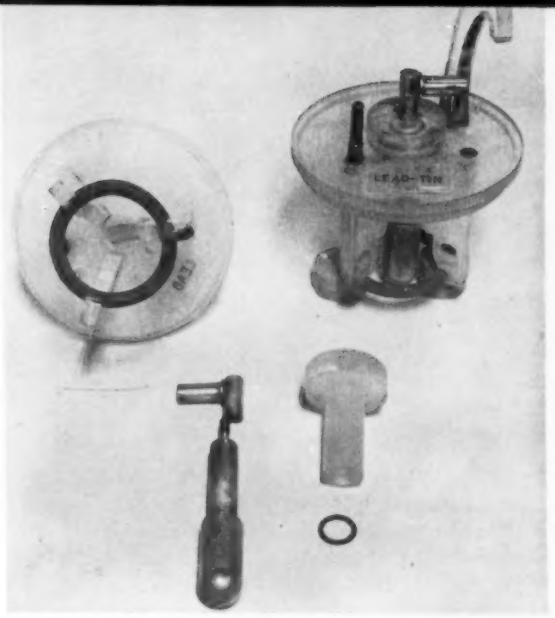


Fig. 1. Cathode, mask and fixtures

As can be seen in Figs. 1 and 2, the cathode and stem are one piece. It is made of brass, hollowed out with the steel screw plug brazed in. Since the threads on the screw plug are not exposed directly to the plating solution, it was thought best to make this piece of steel to withstand thread wear. The entire piece, with the exception of the threads, is heavily silver plated to prevent erosion. The total weight (including the plating) is approximately 160 grams. The area exposed for plating is as near six square inches as is possible to calculate. As long as the silver surface is unbroken, this unit will withstand repeated plating and stripping without any ill effect, but if any of the brass is exposed to the strip solution it erodes, quite rapidly. The cathodes in the picture have been replated with silver several times.

MASK

The mask, which limits the area exposed to lead-tin, is turned from acryllic plastic and seals the stem by means of an O-ring. Note Fig. 3 that the overall diameter of the mask is larger than the cathode which insures that this unit may be withdrawn from the fixture without touching the newly plated lead-tin surface.

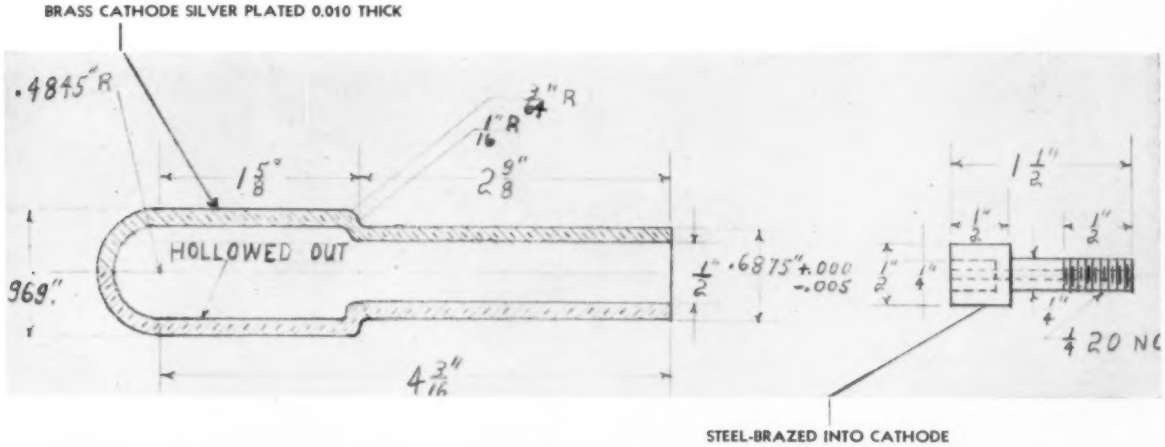


Fig. 2. Cathode

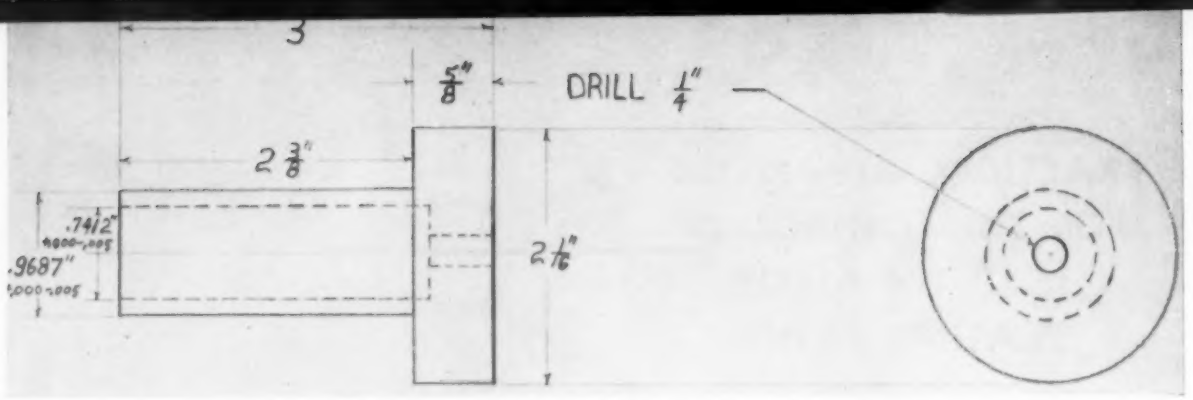


Fig. 3. Mask for cathode

FIXTURE

The jig or fixture is also made of acryllic plastic and is assembled with silver plated steel screws. It will be noted that all of the parts which are exposed to the plating solutions must be protected to prevent erosion. Silver plate withstands the effects of fluoboric acid as well as any metal. The hooked rod which passes through one of the three legs to contact and hold the anode in place is of stainless steel, and is masked to prevent contact with the solution as far as possible. One fixture is equipped with an anode of pure lead, and the other with 93–7 per cent lead-tin alloy. Both anodes are formed of 3/8-in. round anode stock and are replaced as they show excessive erosion. The fixture exactly fits inside a one liter beaker, in which the test is often run. If it is necessary to make the determination in the tank, the plastic handle suspends the fixture from the work rod.

CONTROL BOX

The control box shown in Fig. 4 is a completely self-contained power source. It would be possible to use tank rectifiers to conduct the test in the plating area but this could interfere with production work. Since this determination is done both in the tank or in a beaker sample this box was developed. It consists of a battery pack, an ammeter, a timer and a variable rheostat which makes it possible to regulate the current used for the test. Fig. 5 shows the complete circuit in use.

METHOD OF USE

The entire apparatus is used in the following manner when it is desired to determine the per cent of tin in the alloy:

Both cathodes are cleaned, dried and carefully weighed on an analytical balance. Then they are installed in the mask which is in turn placed in the fixture. The fixture with the pure lead anode is suspended in a solution of Lead Fluoborate and Fluoboric Acid which contains 90–120 g/l Pb and 15–30 g/l free HBF_4. 0.3 g/l of peptone is also added. This solution is preserved and used indefinitely as the plating test does not seem to affect it after much use. The other fixture with the lead-tin anode is suspened in a sample of the bath under examination. The leads are connected so that the two fixtures are in series. The timer which is also a switch is turned on and set for approximately 15 minutes and the rheostat adjusted so that the ammeter reads 1.25 amp. If the batteries are not too fresh it may be necessary during the 15 min interval to readjust the current.

When the plating time is completed, the fixtures are removed from the solution and rinsed. The cathodes are removed, distilled water rinsed, acetone rinsed and allowed to completely dry. They are again weighed and the net gain of each cathode is noted. These weights are the basis of the calculations which follow.

CALCULATIONS

1. Per cent tin in alloy =

$$134.1 \left(\frac{\text{net wt gain on Lead Plated Cathode}}{\text{net wt gain on Alloy Plated Cathode}} - 1 \right)$$

This calculation is identical with the one given in the DuRose and Hutchinson paper.

2. Number amp min used in test =

$$\frac{\text{net wt gain Lead Plated Cathode}}{0.06441 \text{ (g of lead deposited by 1 amp/min)}}$$

This calculation uses the electrochemical equivalent of lead and assumes the lead bath (coulometer) to be 100 per cent efficient. This has been checked with a copper solution and found to be reasonably accurate.

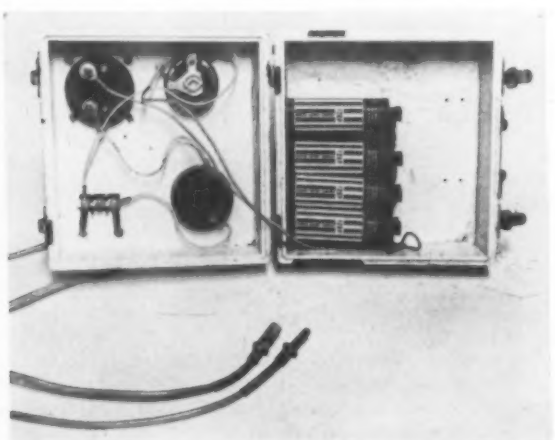


Fig. 4. Inside of control box

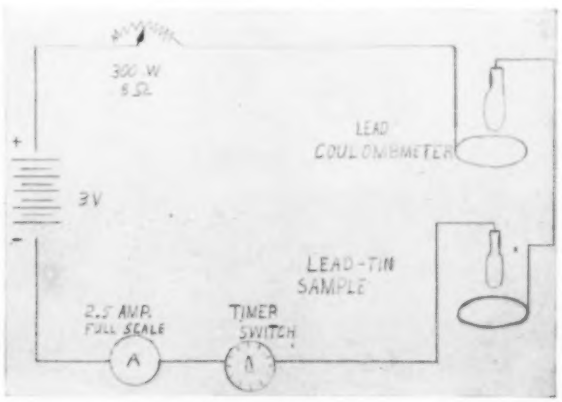


Fig. 5. Schematic diagram of the circuit

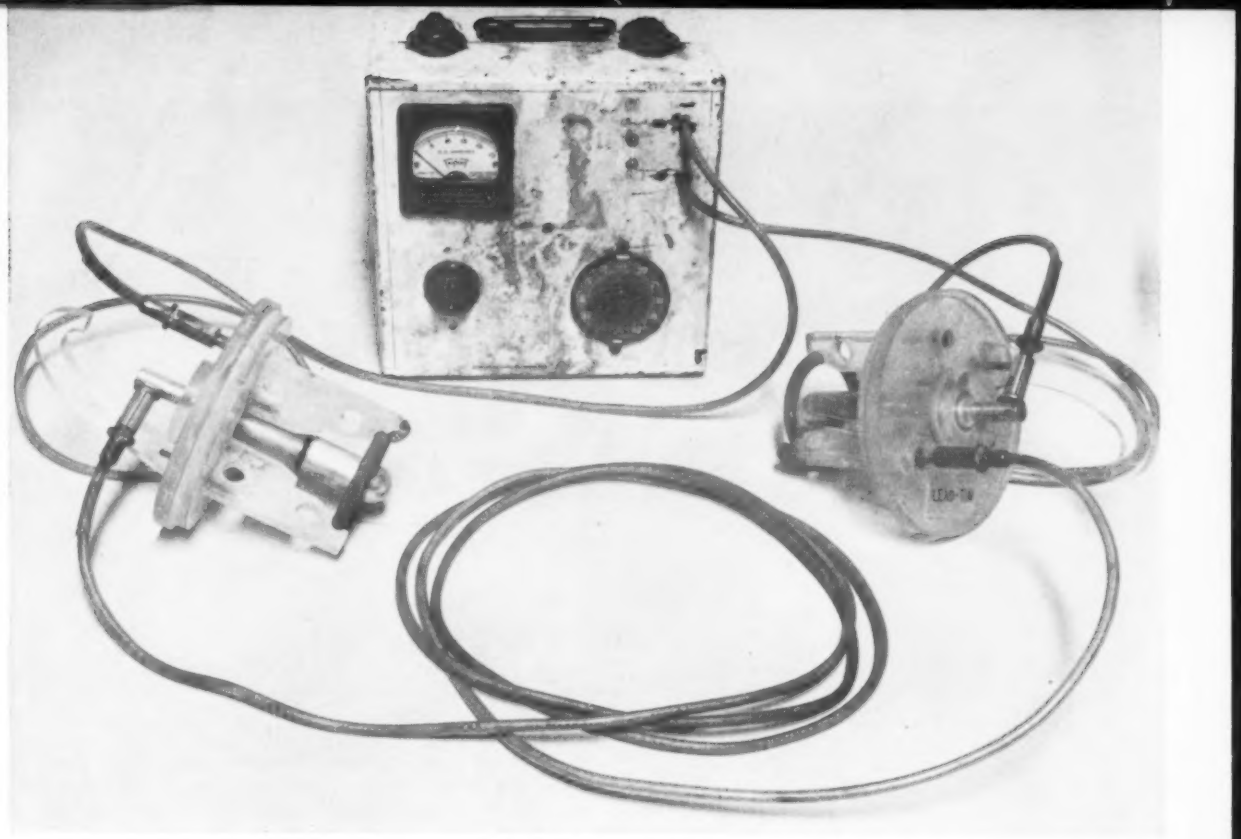


Fig. 6. Entire apparatus

3. Grams of Alloy deposited per amp/min =

$$\frac{\text{net wt gain Alloy Plated Cathode}}{\text{amp/min used in test}}$$

Ampre minutes obtained from Step 2.

4. Plating Time =

$$\frac{\text{Thickness in inches} \times \text{area in sq in.} \times 180.2}{\text{Plating rate (Step 3)} \times \text{current}} - \text{Time in minutes}$$

The factor 180.2 represents the wt in gr/cu in. of the alloy. Using the area of the cathode as 6 sq in., the thickness as 0.0001 and the current as 1.25 amp, it is possible to establish a factor which will give a plating time for any given thickness (in units of 0.0001 in.) at a specific current density (in this case 30 asf).

Therefore:

$$\text{Plating Time} = \frac{0.0865}{\text{Plating Rate}} = \text{No. of minutes to plate alloy 0.0001 at 30 asf.}$$

The information obtained in Step 4 is given to the operator of the plating tank for his use in the production plating of various parts.

Since the configuration of certain parts may require that it be plated at a current density other than the one calculated above, it is possible to vary this condition throughout the entire test and calculation and come up with a plating time, applicable to, say 15 asf.

ADVANTAGES

The method is used in connection with a routine wet analysis of the bath constituents (stannous tin, lead and fluoboric acid), and a method similar to the one offered by Azzolino[2] is employed to determine the need for adjustment of the constituents and/or addition agents (peptone and hydroquinone). With the apparatus described it is possible to get an on-the-spot picture of the condition and plating characteristics of the bath at any time.

ACKNOWLEDGMENTS

The author wishes to express appreciation to all those persons, too numerous to list, who contributed assistance in the fabrication of the various pieces of this equipment.

REFERENCES

[1]DuRose, A. H. and D. M. Hutchison, "Influence of Operating Variables on Composition of Electroplated Lead-Tin Alloys," Plating **40,** 470–476, 630–632 (1953).

[2]Azzolino, Joseph, "Lead Tin Alloy Plating for Aircraft Engine Components," Plating **44,** 1180–1182 (1957).

Robert L. Garrett was born in Bluefield, West Virginia. After attending the University of Illinois, he was a civilian instrument mechanic for the USAAF during World War II. Mr. Garrett has been with TWA for 13 years, first as instrument mechanic and for the past six years as solution control chemist in the plating shop.

He is a member of Kansas City Branch of the AES and has been Branch secretary since 1957.

COLOR ANODIZING

ENTERS THE AIRCRAFT FIELD

by ED DELAMATER*

A FEW YEARS AGO, a major step in bringing color anodizing to the aircraft industry was made when Eastern airlines ordered its manufacturers to gold anodize the interiors of their flagships. The gold anodizing of the Eastern airline ships is perhaps the most fabulous for prop-driven aircraft.

Through extensive use of color anodizing, styling engineers are now providing more and more luxurious and beautiful interiors for the Jet age of commercial aviation. Anadite, Inc., from the very inception of the color anodizing program for commercial aircraft, has played a predominant role in the development of color anodizing methods and production procedures.

Parts are inspected for proper racking before immersion into color dye tank.

REQUIREMENTS HIGH

Complete interior trim items such as: ash trays, panels, lighting fixtures, airvent filters, window frames, moldings and many other aluminum hardware items, are anodized in gold and other colors from light pastels to dark blues and gun metal. Quality control requirements are unusually high in approaching that of jewelry finish both as to the surface and uniformity of colors over a wide range of alloys. (5052, 2024, 6061, 6063, 2014, 1100)

STRICT QUALITY CONTROLS

In order to produce the end product, it became apparent that exceptionally strict quality controls had to be maintained on all handling and processing phases. To hold anodizing variables to absolute minimums, this firms engineers designed and installed a unitized anodizing line. Tanks are of all stainless steel construction and rubber lined. Heating is accomplished with steam through plate type coils, thermostatically controlled to plus or minus five (5) degrees. Agitation is provided to all tanks by use of low pressure air pumps through stainless or plastic piping. Power is supplied by 28 volt rectifiers with remote power controlled panels located at anodizing stations. Anodizing tanks are provided with controlled agitation, heating, and cooling coils to confine the desired temperature within $\pm 3°$.

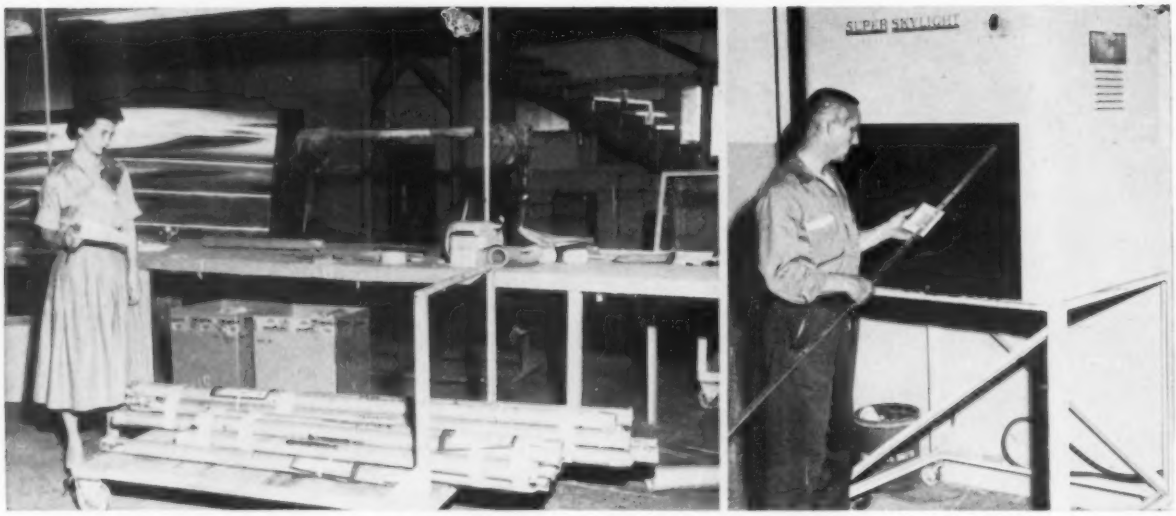
* Chief Quality Control Engineer, Anadite, Inc., South Gate, California

Panels are immersed in gold dye tank.

POLISHING AND BUFFING

Polishing and buffing of items, prior to anodizing is an all important phase for it is here that the final finish, end product is determined. Two types of surface finish are in general use: bright mirror buff and grained satin finish. Polishing is accomplished first by cutting down the critical color surfaces with belt of 240–325 grit aluminum oxide. After the polishing operation, the parts are individually wrapped for transporta-

Final inspection is given gold anodized strips before packaging.



(Left) Production control final check on color anodized parts before shipping. Each part is wrapped individually so that no two parts ever touch each other. Parts are then placed in durable cardboard shipping tubes. (Right) Each color anodized part is checked and rechecked against manufacturers color chip under absolute daylight and twilight conditions in a precision color matching machine.

tion to the anodizing operation. The importance of proper surface preparation cannot be over-emphasized. In the anodizing operation, poor surface preparation will cause light areas, poor film formation and streaking.

PRODUCTION FLOW CHART

Rigid production control procedures must be rigidly adhered to. The following is a production flow chart of a color anodizing operation:

1. Receive and inspect
2. Clean and deoxide
3. Polish and buff
4. Inspect
5. Rack and process
6. Vapor degrease
7. Light alkaline clean
8. Deoxide
9. Anodize
10. Neutralize
11. Gold or color dye
12. Seal in a solution of Nickel acetate
13. Dry

    (Not included are special rinses between each operation)
14. Inspect
15. Package

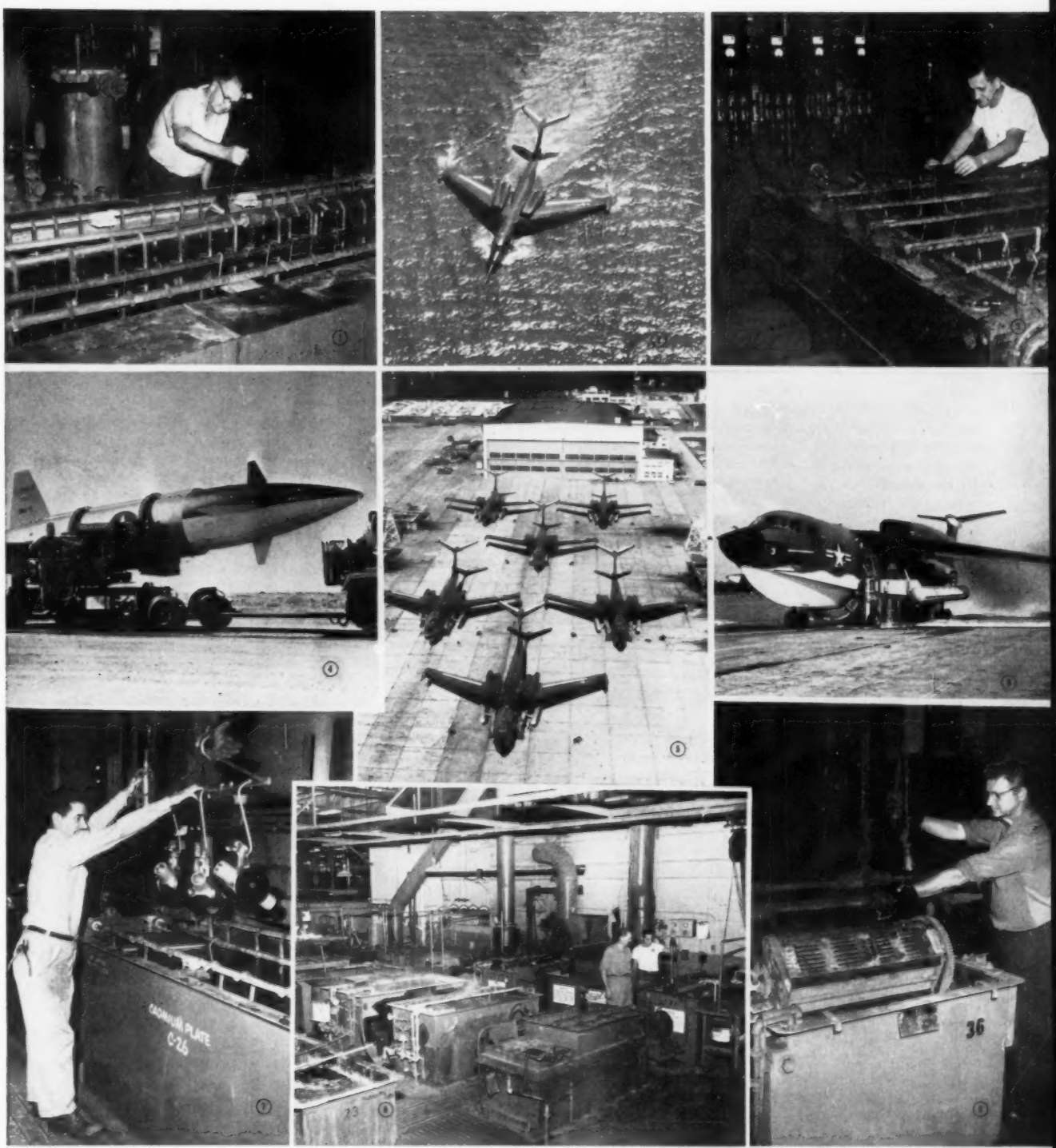
UNIFORMITY

Uniformity is maintained in color by varying current densities and length of the anodizing time, while holding dye time consistent. Alloys 2024, 6061 and 6063 retain a darker coating as compared to a lighter shade for 5052 and 1100. This is compensated for by adding a darkening dye prior to light pastels or gold to bring the alloys within the same color range as the darker alloys. To provide quick dye changes without interferences and possible delay in production, rollaway dye storage tanks are used for the many additional colors now being called for. The improvements of color anodizing will be made when research and development have improved the use of metallic precipitates in conjunction with organic dyes.

COLOR MATCHING

All parts processed are indivually color matched under absolute daylight and twilight conditions in a precision color matching machine. Various alloys, such as 5052, 6061, 6063 and 2S are color anodized uniformly to one certain color chip. After the parts are inspected, they are packaged individually under utmost supervision for shipment to the prime contractor. Today, many of the airlines are specifying color anodized interiors and in particular, gold. Anadite, is now processing three types of gold: pink, rose and yellow. The pink gold, designed by Raymond W. Loewy & Associates, is a new innovation in commercial airline interiors and comes into being when Douglas Aircraft starts delivery of the DC 8. Besides having an attractive finish, whether it be gold or color pastels, each anodized aluminum part has excellent protection against corrosion.

Ed. Delamater is known to be one of the foremost authorities on metal finishing. Mr. Delamater has spent over 15 years in the finishing field including plating, ceramics and plastics. He has been a plant manager, research director, etc. and most recently, in his capacity of Chief Quality Control Engineer of Anadite, Inc., South Gate, California, has been devoting his time to developing quality control procedures and methods for metal finishing operations. For 12 years, Mr. Delamater has been a member of the American Electroplaters' Society.



PLATING AND METAL FINISHING INDISPENSABLE TO AIRCRAFT AND MISSILE PRODUCTION

(1) Cadmium still tank for plating of rocket engine parts at Bell Aircraft Corporation. (2) Martin SeaMaster jet seaplane. (3) Chrome-plating of rocket engine parts at Bell Aircraft. (4) The GAM-63 Rascal air-to-surface guided missile built by Bell Aircraft for the U.S. Air Force. (5) The nation's first seaplane striking force is represented in these six Navy P6M SeaMaster jet seaplanes in squadron formation on the ramp of The Martin Company's Baltimore seadrome. (6) The SeaMaster emerging from the water at Martin's seadrome powered by four Allison J-71 turbojet engines. (7) Cadmium plating at Sikorsky Aircraft, Stratford, Connecticut. (8) Cleaning, rinsing and plating tanks at Beech Aircraft Corporation's Wichita, Kansas plant. (9) Cadmium barrel plating of small airplane parts at Bell Aircraft.

SIR ISAAC NEWTON AND THE INTERNATIONAL GEOPHYSICAL YEAR

by LOUIS MICHELSON

Keynote address at the AES 45th Annual Convention

THE PRINCIPLE OF THE ORBITING SATELLITE as we know it today is not new in theory. About 300 years ago a young man who gained in fame in later years under the name of Sir Isaac Newton conjectured the following recipe for an orbiting body. A mountain 300 miles high (this was a hard commodity to come by at that time, and it is even harder to find now, as most of the mountains in existence are only about five or six miles high at the most) place one high powered cannon. Within this cannon place powder and a ball. Test fire the ball, and add more powder each test shot until the trajectory becomes flatter and flatter with increased amount of propellant. Soon the shot will fail to strike the base of the mountain but continue to fall around the earth's curved surface at the same curvature it had when it left the muzzle of the cannon. In this way, Mr. Newton's solid cannon ball in reality could become an uninstrumented satellite.

Two of the big disadvantages for Mr. Newton were, 1) No mountain with a height of 300 miles was available, 2) A cannon with the required muzzle velocity of 5 miles per second was unknown at that time. Thus, Mr. Newton went back to working with available materials such as apples, parchment and quill.

The German Army under Hitler was next to use ideas fringing on Mr. Newton's advanced theory. In 1942 and 1943 the High Command directed the Artillery General Staff to attempt to shell the coastal ports of England, and even London if at all possible. To undertake this task, they decided instead of loading great quantities of powder into the breech of the gun to turn it around and shoot the propellant out of the muzzle end of the gun and project the cannon; thus, the rocket type of projectile came into being.

Shooting a shell from the ground at very high velocity did not make much sense anyway because down here on the surface of the earth where we live, the air density is high. You would have to eject the shot from the muzzle of the cannon with the highest velocity it would ever have. It would be traveling very rapidly where the air was dense, and encounter high friction drag. What you really wanted was to take off from the ground slowly, keep accelerating for a long time, and reach maximum velocity where the air was very thin.

This is exactly what the Germans did with the V-2. The V-2 can be considered a gun in which the shot you throw out is the propellant that is ejected from the rocket motor nozzle. This imparts a reactive force to the missile itself, very much as when you fire a bullet there is a reactive force on the gun. They then loaded a large amount of propellant in this missile and continued to fire it out the muzzle end of the motor for a long time, gradually building up their velocity. Eventually they got up to a speed in the order of 5000 feet per second, or about one mile per second. This is about one-fifth of the velocity you would have to have to put a shot into orbit around the world, but nevertheless was enough to throw warheads 100–150 miles to England, and this they proceeded to do. The Germans fired some 3000 such missiles at England in the closing year of World War II.

Louis Michelson

After the war, with the information gained by our Air Technical Intelligence Sections from Germany's data and records, this country accelerated its rocket investigations. We started with the firing of captured German V-2's at White Sands, New Mexico, and Cape Canaveral, Florida and General Electric Company was deeply involved in this program. From there we went on to sounding rockets, such as the Bumber Project using a V-2 with a solid rocket 2nd stage. This combination held the altitude record for many years.

These programs continued until late 1955, when a group of scientists representing the United States proposed to the President that our country's contribution to the International Geophysical Year could be the launching of an instrumented satellite via a three stage rocket.

On July 29, 1955, the White House announced the plans for the construction of such a vehicle and satellite, with the Navy being given management of the program, under the direction of Dr. John P. Hagen of the Naval Research Laboratory—Thus, Mr. Newton's project was reborn and funded.

At this time it was possible on paper but, in reality, the launching of such a satellite would still be a tremendous technical feat. The best rockets fired to that time would occasionally reach 7000 or 8000 feet per second; to get into orbit required 25,000 feet per second of final velocity. It is characteristic of rockets that the burnout velocity it has when all the fuel is expended, is mainly dependent upon two things, the mass ratio which is the ratio of fuel weight of the total weight of the rocket, and the specific impulse of the propellant.

In other words, if you could make a rocket which was 99 per cent fuel, it would have a mass ratio of .99. This would be very good, for as the rocket burned its fuel, there would be little left but a very small mass toward the end. This mass gets accelerated to a terrific velocity since the thrust or push remains constant until all the fuel is gone. Obviously, then, to have a very high mass ratio, everything that does not burn must be very light.

Secondly, you need the most efficient propellants that you can get. We describe efficiency of propellants in a term called "specific impulse." We say "specific impulse" is the pounds of push you get from each pound of propellant you burn per second.

(Continued on page 1164)

Louis Michelson, keynote speaker at the 45th Annual Convention of the AES, is manager of the Rocket Engine Section, Flight Propulsion Laboratory Department, General Electric Co., Cincinnati, Ohio. He is a graduate of Massachusetts Institute of Technology with a BS in Physics and is a member of Scabbard and Blade, American Rocket Society, American Ordnance Association, American Institute of Electrical Engineers and Institute of Radio Engineers.

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PREVIEW OF FUTURE PLATING ISSUES

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The always-popular Christmas Issue embellished this year by Golden Jubilee news and features.

•

JANUARY 1959
ABRASIVES AND MECHANICAL FINISHING. Developments in the various finishing methods will be featured in this annual issue.

•

FEBRUARY 1959
A strong issue presenting technical and scientific articles enriching knowledge in electroplating, metal finishing and allied arts, plus general articles of wide readership interest on the Golden Jubilee generally and, particularly, on the AES's SIXTH INTERIM MEETING and its Golden Jubilee Convention and Industrial Finishing Exposition, including the Fifth International Conference on Electrodeposition and Metal Finishing.

•

MARCH 1959
ORGANIC COATING. The importance of organic finishing to electroplaters is increasing rapidly. New and review material will be presented in this third annual edition.

•

APRIL 1959
RESEARCH ISSUE. A feature will be its documentary section embracing the AES's Research Program in American and Canadian universities and foundations, including an historical summary by Dr. William Blum plus a status report on current research projects by AES's current Vice Chairman for Research. Also other technical and scientific papers plus Golden Jubilee news and developments.

•

MAY 1959
PRE-GOLDEN JUBILEE CONVENTION. A larger than usual issue featuring both technical and scientific papers, together with important coverage of Golden Jubilee Convention, Exposition and International Conference news and data of broad readership importance.

•

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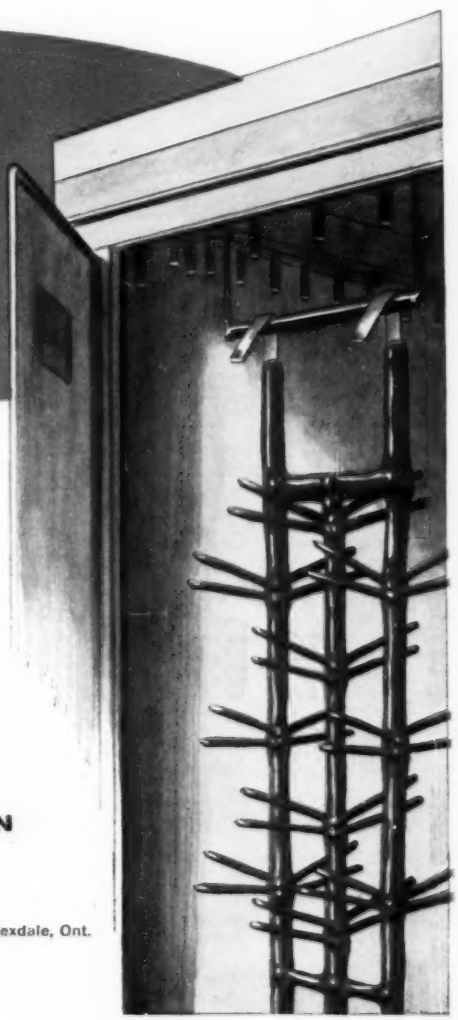

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VANTON *notes on fluid handling*

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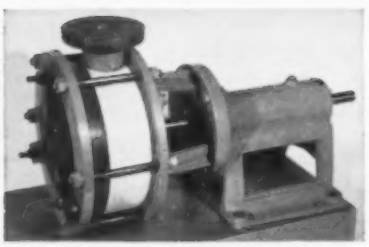

BRAND NEW: PVC CENTRIFUGAL PUMP. For acids, caustics, pharmaceuticals, lithographic, plating, and all other kinds of sensitive solutions, Vanton's new PVC pump offers a low-cost answer. Constructed with all liquid-exposed parts of unplasticized, unmodified polyvinyl chloride, these pumps are simple to maintain, and are generally lower in cost than competitive special-alloy pumps. Size range: 10 - 180 GPM. CIRCLE ITEM 12.

PLASTIC GATE VALVES NOW AVAILABLE WITH SOCKET-WELD ENDS. A complete line of socket-weld Flex-Plug Plastic gate valves, extending the present line of screwed-end valves, is now available from Vanton in sizes from ½"—2" in both PVC and styrene-copolymer. The Flex-Plug valve, first of its kind, offers the combined features of straight through no-pressure-drop flow with close throttling control. The combination of these two features of a gate and globe valve makes the Flex-Plug one of the most versatile available. Now, with the addition of socket-weld ends, the unique plastic Flex-Plug valve can be used on the most severe services in the chemical, pharmaceutical, photographic and other industries. CIRCLE ITEM 11.

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FIRM_____

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Sealless Pump Proves Answer to Quality Plating of Grid Wire

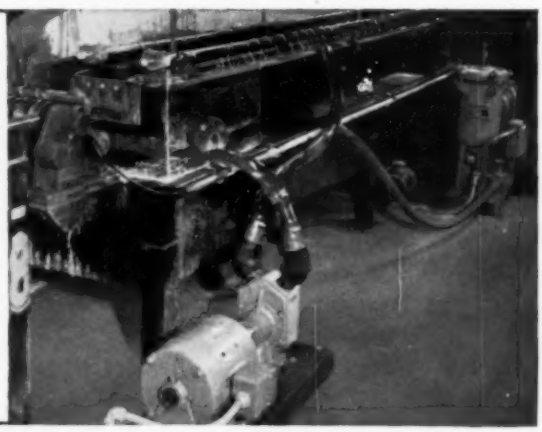
Rejections of silver-plated electronic tube grid wire due to porosity and blackening of plating surface are no longer a problem with engineers at the Wilbur B. Driver Company plant in Newark, N.J., since they discovered that a Vanton sealless plastic pump eliminates the causes. Driver, a manufacturer of quality precision alloy wire, had before this time been confronted with periodic plagues of rejection, foaming of plating solution, pump leakage, shaft scoring, and excessive packing maintenance.

Driver engineers finally traced the trouble to liquid leakage through the packing of the conventional metal pumps then used. This caused not only excessive deterioration of packing, but also scoring of pump shafts through crystallization of salts from the concentrated solution. Furthermore, air entering the pump through the deteriorated packing was causing the silver-plating solution to foam and deposit a porous finish. Constant preventive maintenance of the stuffing-box packing units was tried, but did not solve the problem for more than short periods of time. Increased operating costs and production interruptions remained a plague.

When Vanton plastic sealless pumps were installed, these problems ceased at once. Porous finish, excessive packing maintenance, and resultant production interruptions are no longer a problem. Entry of air bubbles through packing is eliminated, because there is no packing in Vanton pumps. Crystals formed in the solution do not wear Vanton pump components, because their abrasive action is absorbed by the resilient flexible liner. And of course, because the Vanton pump *has no* stuffing boxes or shaft seals, stuffing-box maintenance and shaft seal leakage are gone for good!

Pump capacities range from ⅛ to 40 GPM. Liners and housings are made in a variety of plastic materials, to suit a wide range of corrosive, acid, and slurry conditions. CIRCLE ITEM 10.

Vanton sealless plastic pump handles a tough assignment to help eliminate leakage, shaft scoring, and other plating problems at Wilbur B. Driver Company plant in Newark, New Jersey.



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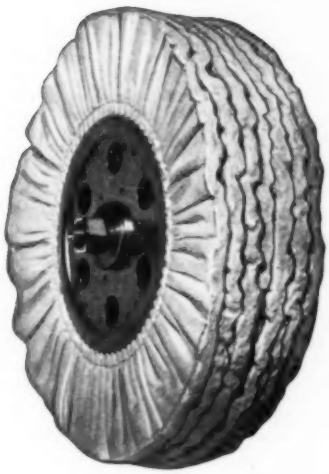

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Our Field Engineers are ready to help you with your polishing or buffing problem—They have the 'know how'; the buff, and, the compound to produce a quality job— FASTER, AND MORE ECONOMICAL. Why not call one in today? You will be glad you did.

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MILESTONES OF AES

A PLATING MAGAZINE original feature during this observance fiscal year of the FIFTIETH ANNIVERSARY of its parent, American Electroplaters' Society, Inc.

THE NATIONAL Electro-Platers Association of the United States and Canada (NEPA) that became the American Electroplaters' Society (AES) of today in 1913 was dedicated, from its 1909 birth, to one principal goal, namely to enrich technical and scientific knowledge thereby fostering advancements in electroplating, metal finishing and allied arts. In a half-century's lifetime, neither pathfinder NEPA nor AES, its descendant, deviated by even a millimeter from target. Employed to that purpose with progressive development in breadth and technique through the years, have been the respective tools for imparting knowledge, including educational assembly at both national and Branch levels. The convention and the exposition are educational media that have played a large role in the perspective and performance of the Society in its fifty-year life span to date.

WITHIN four months of NEPA's October 18, 1909 incorporation as a New York non-profit educational association, it conducted its First Annual Banquet in New York City, forerunner of the Society's Annual Conventions. These Banquets grew in scope and stature annually. NEPA's third banquet not only was by far its largest but it also featured (quoting QUARTERLY REVIEW), the "first exhibition of electro-plating apparatus and finishes in the United States." Held in New York, Saturday, February 10, 1912 as the afternoon phase of that Third Annual Banquet, "the informal exhibit—although worked up only ten days before the banquet—met with such willing responses from manufacturers of electroplating supplies," said the REVIEW, "that nothing short of a full-fledged exhibition will satisfy the demands for next year."

The Egyptian Lacquer Manufacturing Company of New York provided the day's badges. "The buttons," QUARTERLY REVIEW reported, "were consecutively numbered, and as each guest arrived, the Reception Committee had him register, then presented him with a badge. On one of the walls of the room was a bulletin headed, 'INTRODUCE YOURSELF,' and opposite the corresponding number of each badge, was the name and address of the guest. This feature added much to the pleasure of the day, and through it, many old friendships were renewed, and men known to the trade by name only, became acquainted with their fellow-platers."

The exhibitors' list ran the gamut of that era's progressive and growing sources of supply, many of whom are today's prominent suppliers whose names grace PLATING MAGAZINE's advertising columns.

That same 1912 winter evening, 182 NEPA members and guests, males all, convened at the banquet itself compared with 130 the prior year. "The hall," according to QUARTERLY REVIEW, "was beautifully decorated, and multi-colored carnations were scattered over the tables. Elegant engraved menu cards upon which the emblem of the Association were embossed in gold were the gift of the Celluloid Zapon Company."

President Charles H. Proctor, NEPA's founding father, was Toastmaster. Among technical papers presented at that evening's meeting was "Galvanizing" by Louis Pothoff, President of the United States Electro-Galvanizing Company of Brooklyn, N.Y. "It was illustrated by many stereoptican views made especially for the occasion."

From the Eureka Pneumatic Spray Company, each guest present received as ash tray finished in old ivory. The same source presented President Proctor with a large statue of Venus de Milo finished in verde antique. Philadelphia Branch President Clement was honored with a pair of Bonheur models of the lion and lioness, finished in black with verde relief—and a twenty-inch statue of "The Athlete" was given to the newly organized Indianapolis Branch. And as "wrap-up" of its account of this historic NEPA affair, QUARTERLY REVIEW held, "The good will and the good fellowship shown in these banquets do more than anything else could do to bring the platers into a more friendly relation. They are Islands of Good Cheer in the Seas of Solution."

IN 1913, pioneering NEPA became AES. Continuing as a New York non-profit educational association but now operating under a new Constitution and By-Laws, AES held its First Annual Convention in New York on June 1, 1913 with Founder Proctor presiding. At that First Annual Meeting of the Supreme Society, AES's first National Officers were elected, the late George B. Hogaboom taking office as the Society's first National President. That relatively humble First Annual Convention of a single-day's duration represents the wellspring from which the Society's subsequent Conventions developed step-by-step into today's sizable annual members' assemblies, each now spanning at least four consecutive days in length and each having had at least four years of planning and preparation by the respective AES Branches hosting them. Each of them has not only concentrated

PORTION OF AES FAMILY PRESENT AT AES'S FIRST DETROIT CONVENTION (1918)

MILESTONES OF AES

upon educational enrichment but has also fostered fellowship.

For the first time in its history, the Society conducted an Annual Convention elsewhere than in New York City in 1914, its Second Annual Convention being held in Chicago. From 1913 to date, it has consequently visited the following 24 municipalities the following number of times with Annual Conventions:

Detroit	—4	Cincinnati	—2	Asbury Park	—1
Cleveland	—4	Montreal	—2	St. Louis	—1
New York	—3	Washington	—2	Providence	—1
Chicago	—3	Boston	—2	Toledo	—1
Philadelphia	—3	Buffalo	—2	Toronto	—1
Milwaukee	—3	Pittsburgh	—2	Bridgeport	—1
Dayton	—2	Newark	—1	Grand Rapids	—1
Rochester	—2	Atlantic City	—1		
		Indianapolis	—1	Total	46

AES journeyed outside of the United States for its Annual Convention for the first time in 1925 holding its 13th Annual Convention in Montreal, Canada's handsome "Paris of the New World." Three years later, it revisited the Dominion by conducting its 16th Annual Convention in Toronto. And in 1957, it returned to Montreal for its memorable 44th Annual Convention with a registration of nearly 1500 members and their families.

Chronologically, AES Annual Conventions have been held in the following municipalities from 1913 through 1958, the AES Branch of each listed community serving as Host Branch with one exception, namely the Newark Branch which also hosted the Atlantic City and Asbury Park Conventions:

1913—New York, N. Y.	1936—Cleveland, Ohio
1914—Chicago, Ill.	1937—New York, N. Y.
1915—Dayton, Ohio	1938—Milwaukee, Wis.
1916—Cleveland, Ohio	1939—Asbury Park, N. J.
1917—St. Louis, Mo.	1940—Dayton, Ohio
1918—Detroit, Mich.	1941—Boston, Mass.
1919—Philadelphia, Pa.	1942—Grand Rapids, Mich.
1920—Rochester, N. Y.	1943—Buffalo, N. Y.
1921—Indianapolis, Ind.	1944—Cleveland, Ohio
1922—Cincinnati, Ohio	1945—Pittsburgh, Pa.
1923—Providence, R. I.	1946—Pittsburgh, Pa.
1924—Milwaukee, Wis.	1947—Detroit, Mich.
1925—Montreal, Canada	1948—Atlantic City, N. J.
1926—Newark, N. J.	1949—Milwaukee, Wis.
1927—Toledo, Ohio	1950—Boston, Mass.
1928—Toronto, Canada	1951—Buffalo, N. Y.
1929—Detroit, Mich.	1952—Chicago, Ill.
1930—Washington, D. C.	1953—Philadelphia, Pa.
1931—Rochester, N. Y.	1954—New York, N. Y.
1932—Philadelphia, Pa.	1955—Cleveland, Ohio
1933—Chicago, Ill.	1956—Washington, D. C.
1934—Detroit, Mich.	1957—Montreal, Canada
1935—Bridgeport, Conn.	1958—Cincinnati, Ohio

During that long span, the Pittsburgh Branch is the only one that has hosted an AES Annual Convention in two successive years. Of these 46 conventions held from 1913 through 1958, some 22 were held in communities east of Pittsburgh, including Canada—24 were held in Pittsburgh or in cities west thereof. Convention site farthest west to date has been St. Louis but AES is scheduled to visit the Pacific Coast itself in 1960 with an Annual Convention to be held in Los Angeles in July 1960.

MOST AES Annual Conventions of the past included exhibits but the AES's first Industrial Finishing Exposition per se was held in Detroit in 1947 concurrently with the Society's 34th Annual Convention hosted in the Motor City by that dynamic Branch. The second such exposition was held in Atlantic City the following year with the Newark Branch as Convention/Exposition host. And in 1952, the Chicago Branch hosted the Society's third such exposition and its 39th Annual Convention.

AES's last Industrial Finishing Exposition to date occurred in 1955 as adjunct of the 42nd Annual Convention, a successful convention/exposition conducted in Cleveland with the industrious Branch by that name as host.

Eight Cleveland hotels were used to house the multitudes of AES members, their families and guests, including numerous exhibitors, who attended that four-day Cleveland Convention/Exposition, June 20–23, 1955. The planning and effort of nearly a hundred devoted Cleveland Branch members and their wives were expended to make the event educationally and relaxationally effective.

A total of 27,020 square feet of exhibit space was employed. Exhibitors' teams included company presidents, vice-presidents, sales managers, sales personnel, others. The Conventions' Educational Sessions themselves drew an aggregate four-day attendance of 2,041. Nearly 450 individuals attended the nine industrial plant tours that the 42nd Annual Convention featured. Some 1,250 members and their families and guests were present at the last evening's Farewell Banquet, a far cry from the 182 pioneers present at NEPA's historic Third Annual Banquet, February 10, 1912.

IN BACKTRACKING through time, then retracing steps appraisingly along the pathway of AES history, there is constant view of the concurrent progress of the "plater and metal finisher" and the "plating and metal finishing supplier." These latter not only displayed up-to-date equipment and supplies at AES exhibitions and expositions through the years, particularly as products of their experimentation and development achieved reality, but they also cooperated in AES assemblies by providing a good measure of relaxational fare.

Many of them employed the advertising columns of MONTHLY REVIEW, the AES's monthly magazine from the very start of advertising in MONTHLY REVIEW back in September 1933. Most of these, on merit, continued AES advertising after MONTHLY REVIEW became today's PLATING MAGAZINE in January 1948, and have advertised in PLATING consistently, from then to now to mutual benefit.

Most of the leadership and much of the rank and file of these companies are individual Branch members of today's AES, and many of these companies, as AES Sustaining Members, are helping to finance the Society's vital research program being conducted in American and Canadian universities and foundations.

Through the years, they have assisted the AES in accomplishing NEPA's mission enunciated by Walter G. Gold thus at the "Open Meeting" of the Philadelphia Branch held at the Windsor Hotel of that city, Wednesday, February 21, 1912:

> Therefore, gentlemen, we hope that the progress of NEPA will appeal to you with its progressive slogan which is practically this: All for the plater and the electro-plating business. May the years ahead witness a great forward movement. If we all pull together, the business will certainly be raised in the realm of business, and each member of the Association will be bettered as a result. As the Scripture says, "Come thou with us and we will do thee good."

—JOHN P. NICHOLS

Intent audience at the popular panel discussion at the 1958 AES Cincinnati Convention.

BOARD AND DIXIE GROUP RELEASE TENTATIVE

SIXTH INTERIM MEETING PROGRAM

As approved by both the Executive Board of the Supreme Society and by the Dixie Regional Group, host body, the Tentative Program of the "Sixth Interim Meeting and First Dixie Regional Technical Sessions and Banquet" that will be held at the Dinkler-Plaza Hotel, Atlanta, Georgia, February 13-14, 1959 as a mid-winter feature of the AES's GOLDEN JUBILEE stands as follows at this writing:

FEBRUARY 12
8:00 p.m.—Registration, Dixie Regional Meeting

FEBRUARY 13
8:00 a.m.—Registration, Dixie Regional Meeting
9:00 a.m.—Executive Board Meeting, Executive Secretary's Suite (All Day)
9:00 a.m.—Plant Tour, Dixie Regional Group
1:30 p.m.—Opening Session, Dixie Regional Meeting
2:00 p.m.—Educational Session "A", Dixie Regional Meeting

FEBRUARY 14
8:00 a.m.—Registration, AES Delegates/Alternates
8:00 a.m.—Registration, Dixie Regional Meeting
9:00 a.m.—Sixth Interim Meeting, AES Supreme Society
9:00 a.m.—Educational Session "B", Dixie Regional Meeting
12:00 noon—Luncheon, Delegates/Alternates
1:00 p.m.—Sixth Interim Meeting, AES Supreme Society
6:30 p.m.—Reception, Dixie Regional Group
7:30 p.m.—Golden Jubilee Banquet, Dixie Regional Group

FEBRUARY 15
9:00 a.m.—Executive Board Meeting, Executive Secretary's Suite.

Among other projected sessions, is an informal joint meeting of the AES Executive Board and the Board of Trustees of the Metal Finishing Suppliers Association (MFSA) to be held Friday Evening, February 13, 1959.

ROAD PAVED FOR HONORARY MEMBER NOMINATION

As ordered by the Supreme Society at its meeting in Cincinnati, May 22, 1958, a poll of Branches has been made by the National Executive Secretary, via their accredited Delegates, for Branch nominations for AES Honorary Membership or Award of Merit. Deadline is November 15, 1958 for all such nominations, together with accompanying five copies of the qualifications of each man nominated.

Nominations received by the Executive Secretary by not later than November 15, will, in short order, then be referred to an Executive Board-appointed Honorary Membership Awards Committee for evaluation and selection. That Committee's choices will be considered by the Executive Board at its February 1959 meeting in Atlanta. The Supreme Society itself will then act on Board selections at its June 18, 1959 meeting.

1958 "TECHNICAL PROCEEDINGS" DUE FOR MID-NOVEMBER ISSUANCE

Publishing, in full, the 23 technical and scientific papers presented at the AES's 45th Annual Convention held in Cincinnati, May 19–22, 1958, including the transcript of the discussion that attended their delivery, the 1958 edition of the Society's book, TECHNICAL PROCEEDINGS, is nearing completion and is timetabled for mid-November mailing to all AES members regardless of classification.

Aside from these 23 papers, the 1958 edition of PROCEEDINGS features the transcript of the panel session on "Practical Plating Problems" that was an innovation (and a hit) of the AES's Cincinnati Convention.

A larger book than the 1957 edition, 1958 PROCEEDINGS also carries a front section that includes a complete chronological list of AES Conventions and Past Presidents; a day-to-day log of the 45th Annual Convention; a section on the AES Scientific Achievement Award and on the Paper Awards presented at that convention; a full listing of AES's 1958–1959 Boards and Standing and Special Committees, and a complete Branch Directory current as at September 1, 1958.

GOLDEN JUBILEE FLAG ITINERARY INCLUDES FIFTEEN BRANCH STOPS

AES's two Golden Jubilee flags have already been scheduled for appearance as dais backdrops, for hotel lobby display and for other Fiftieth Anniversary symbolic employment at fifteen major Branch Annual Meetings during the 1958–1959 Jubilee observance.

These are included among the Branch events listed by date in the section of this PLATING issue titled "Future Meetings".

Any chartered AES Branch planning a Golden Jubilee event that has not yet notified National Headquarters thereof and placed a reservation for one of the golden flags is urged to do so promptly. Flags are reserved on a "first come—first served" basis.

"PLATING'S" SPREAD GLOBALLY DISTRIBUTED

To meet demand, some 6000 reprint copies of the four-page spread that appeared in the September 1958 issue of PLATING titled, "AES's Golden Jubilee Convention/Exposition Plans Gaining Momentum" have been published. Over half of these have been shipped to England for global redissemination. The balance have been provided to the Detroit Branch for domestic redistribution.

GOLDEN JUBILEE INSIGNE DECAL FOR EVERY AES MEMBER

Through his Branch, each current AES Branch member in good standing will soon receive a decalcomania of the AES GOLDEN JUBILEE insigne for use on the rear window or elsewhere on his car.

As promptly as available, National Headquarters will ship proper quantities of the "decal" to the Secretaries of AES's 58 chartered Branches for redistribution by them among their Branches' members in good standing.

A decal will also be sent by Headquarters to each of the Society's Members-at-Large and Sustaining Members.

AES NEWS

NEWARK BRANCH ANNUAL HAS JUBILEE FLAVOR

The Newark Branch has completed plans for its annual educational session and Christmas party to be held on successive nights at the Hotel Robert Treat, Newark, N. J.

Members of the local Branch will be the featured speakers at the educational session on Friday evening, Dec. 12. A Dutch Treat dinner will precede the session at 6:30. Shortly before eight o'clock, the session will open with a motion picture entitled "In the Beginning." Two speakers have been scheduled. Eugene Wagner of Hy-Grade Electro Plating Co. will discuss "Lead Plating." The title of the paper to be presented by Paul Theusen, Metal Processing Co., is "Electroless Plating."

The Christmas Party, consisting of dinner, entertainment and dancing, will be held on the following evening, Saturday, Dec. 13. The tickets are $7 each and are obtainable from George Wagner, Hy-Grade Electro Plating Co., 35 Fourth St., Newark, N. J.

RESEARCH COMMITTEE ACTS TO CREATE ARRESTING EXPOSITION EXHIBIT

A Subcommittee composed of D. G. Foulke, J. D. Thomas and W. L. Moline has been authorized by the Research Committee to create an outstanding Research Program display in the AES's FIFTIETH ANNIVERSARY LOUNGE at the Fifth Industrial Finishing Exposition that will be an element of the Society's GOLDEN JUBILEE CONVENTION in Detroit, June 15–19, 1959. That action was taken by the Research Committee at its meeting held at National Headquarters, Newark, September 17 with Dr. Russel E. Harr, its Chairman, presiding.

As visualized, the Research Program's display will not only tell an historical story of AES research but will also dramatize that program's current status. It will be an element of the FIFTIETH ANNIVERSARY LOUNGE that will also spread before the exposition's large expected audience, the kaleidoscope of AES's half century biography and the story of AES's PLATING MAGAZINE.

EXECUTIVE BOARD DISPOSES HEAVY AGENDA AT SEPTEMBER MEETING

Meeting in Detroit, September 19–20, the Executive Board, with President Herberth E. Head presiding, faced and disposed of a heavy agenda of business, including consideration and approval not only of the Fifth Industrial Finishing Exposition and of the Golden Jubilee observance budgets but also of the tentative Golden Jubilee Convention Budget.

Among much other business transacted, it viewed and favorably considered the scale model of the FIFTIETH ANNIVERSARY LOUNGE of the Society, PLATING MAGAZINE and the Research Program that will be one of the features of the AES Exposition in Detroit, June 15–19, 1959.

It also accepted the final report and the certified audit statement of the AES's successful 45th Annual Convention submitted by the Cincinnati Convention Committee. Moreover, it also approved the program of the Sixth Interim Meeting to be held at the Dinkler-Plaza Hotel, Atlanta, Georgia, February 13–14, 1959. It adopted the memorial resolution that appears on the following page, expressing the Society's grief over the recent passing of Thomas A. Trumbour.

The Board will meet in Special Session in Detroit on Saturday, December 6, 1958, then will convene in regular session in Atlanta, February 13 and 15, 1959.

DETROIT BRANCH TO STAGE IMPRESSIVE GOLDEN JUBILEE CHRISTMAS PARTY

The Detroit Branch's Annual Educational Session and Dinner-Dance, with GOLDEN JUBILEE background, will be held at the Statler-Hilton Hotel of that city during the two-day period, December 5–6. Limited, for compactness and better control, to a maximum banquet attendance of somewhat under 900 Branch members, their families and guests, the event will include all National Officers of the Society as guests of the Branch.

Titled "National Officers Night", the Educational Session phase of the two-day GOLDEN JUBILEE event will feature two speakers, namely John P. Nichols discussing "AES at its Half-Century Milepost" and Dr. A. Kenneth Graham of Graham, Savage & Associates presenting "Electroplating: Yesterday, Today and Tomorrow". Vincent Cassidy, Detroit Branch's Educational Chairman is in charge of the program. Charles O. Durbin is Detroit's Christmas Party General Chairman.

A number of other meetings will also be held during the two-day event, including a special meeting of the Executive Board on Saturday, December 6.

AES Research Committee Meeting at Headquarters, Newark, on September 17, 1958

DUE DATES FROM AES BRANCHES

NOVEMBER 3	Return Sheets signed by both the Branch President and Branch Secretary designating and certifying the Branch's duly elected Delegates and Alternates for Credentials Committee accreditation. The tenure of these Delegates will be from the first Branch Meeting following the 1958 Cincinnati Convention to the first Branch Meeting following the 1959 Detroit Convention.
NOVEMBER 15	Return Sheets from accredited Delegates covering Branch nominations for Honorary Membership and Award of Merit.
DECEMBER 1	Per Capita Taxes from Branches for all Branch Members in good standing covering the 15-month period from April 1, 1958 through June 30, 1959.

In Memoriam

WHEREAS the late Thomas A. Trumbour by his devotion to and long association with the field of electroplating and metal finishing did, for over a half-a-century, render noteworthy service in the development of that industry.

WHEREAS the deceased did in his lifetime contribute greatly to the origin, growth and progress of the New York Branch of the American Electroplaters' Society (AES) and of the Society itself being, in fact, one of the founding fathers thereof.

WHEREAS the bereaved as a business man and as a stalwart of the Metal Finishing Suppliers Association did also earn the respect and affection of a host of members of the industry.

BE IT THEREFORE RESOLVED that the Executive Board of the AES, in meeting in Detroit this nineteenth day of September 1958, does hereby record its grief and that of the Branches and members of the Society and does, in their behalf extend condolences to the family of the departed.

BE IT FURTHER RESOLVED that this Resolution shall both be spread into the Minutes of this Board Meeting and also published in PLATING MAGAZINE, the Society's official organ.

EDITORIAL BOARD PASSES TENTATIVE JUBILEE EDUCATIONAL SESSIONS PROGRAM

At its meeting at AES National Headquarters, Friday, September 26, the Editorial Board, with Chairman John P. Nichols presiding, approved the tentative program of Educational Sessions of the GOLDEN JUBILEE CONVENTION that, as the Fifth International Conference on Electrodeposition and Metal Finishing, will be one of the bright spots of that AES National Convention to be held in Detroit, June 15-19, 1959 with the Detroit Branch as Host.

The tentative program as it passed encompasses, as a climax of the AES's Fiftieth Anniversary observance, some 43 papers to be delivered by experts from nine countries as follows: United States 25; England 9; France 2; Germany 2 and Canada, Holland, India, Italy and Switzerland, one each.

Eleven of these will deal with organic finishing; the balance bear on plating and subjects related to metal finishing, including aluminum, corrosion testing, solution purification, special plating systems, electropolishing and brightening and others. These will be delivered at eleven sessions spread over four-and-a-half days. Two of these eleven sessions will be held at the AES's Industrial Finishing Exposition, the balance at Detroit's Statler-Hilton Hotel.

The Educational Sessions will be launched by the presentation of the first "William Blum Lecture." It will be delivered by Dr. William Blum, first winner of the "AES Scientific Achievement Award," the AES highest honor.

Sessions Chairmen being invited by International Conference Chairman W. L. Pinner to serve in that capacity as a result of Editorial Board authority vested in him will include leaders of plating and metal finishing in the United States, Canada, England and Australia.

An additional paper from Australia, one from France and one from Russia may yet be added to the tentative program. Otherwise, the Editorial Board has frozen the program at the 43 paper limit approved September 26, on the understanding that should any of these 43 papers and/or the three aforementioned possible additions either fail to materialize or fail to pass Editorial Board final review, they will not be replaced.

The Editorial Board will meet in Detroit, January 23 not only to study and appraise abstracts of the program's papers but also to appoint "reviewers" for each such paper when finalized. Present at the September 26 meeting beside Chairman Nichols were Dr. Abner Brenner; G. Ross Davidson; S. Lewis Doughty; Robert A. Ehrhardt; Rodney Leeds; James H. Lindsay; Abraham M. Max; Walter L. Pinner; William H. Safranek and William M. Tucker.

GOLDEN JUBILEE ISSUE
PLATING MAGAZINE
JUNE 1959
WILL INCLUDE ITS
"KALEIDOSCOPE OF AES's
FIRST HALF CENTURY"

Editorial Board in Session at the Newark, N. J., AES National Headquarters on September 26, 1958.

GOLDEN JUBILEE CONVENTION: ITS MEANING TO AES MEMBERS

Detroit, motor car capital of the world, was the fur trading post of the Strait founded by the Frenchman Cadillac in 1701. From approximately a quarter million population at the turn of the Twentieth Century, motor car fabrication has since catapulted Detroit to over two million today and to a proud fifth place among our nation's great cities from the standpoint of population stature. It ranks third as a manufacturing metropolis.

Home port of the AES's dynamic Detroit Branch, the Society's largest chartered affiliate, that Branch will host AES's GOLDEN JUBILEE CONVENTION and Industrial Finishing Exposition, including the Fifth International Council on Electrodeposition and Metal Finishing, June 15–19, 1959 as climax of AES's FIFTIETH ANNIVERSARY observance.

Expected to draw the largest assembly of AES members and their families and guests in the Society's five-decade lifespan to date, including visitors from many countries, these will be housed in a number of Detroit's fine hotels, particularly the two headquarters hotels, The Statler-Hilton and The Sheraton-Cadillac. Convention registration fee is $20 per person (adult male or female).

There will be pageantry marking the Golden Anniversary. There will be educational enrichment via eleven sessions of scientific and technical papers delivered by experts from some nine countries. There will be the largest exhibition of the products and processes of plating and metal finishing suppliers in fifty years of AES. There will be entertainment and relaxational fare aplenty. There will be a program of plant visits perhaps unexcelled in the Society's history. There will be an imaginative Ladies Program that, for range and appeal, should delight AES's ladies. There will be an outing, Wednesday, June 17 that should reach apex of popularity. And there will be gifts and prizes galore.

A Convention kit, including a Hotel Registration Form, will emanate from National Headquarters early in January bound for the address of record of each AES member in good standing. It is recommended that you act on it as promptly as possible after receipt. Expectedly, accomodations will dwindle fast—because, for AES, climaxing its FIFTIETH ANNIVERSARY observvance, DETROIT WILL SHINE IN '59.

SUPPLEMENTARY LIST OF EXHIBITORS 1959 INDUSTRIAL FINISHING EXPOSITION

(SINCE LIST PUBLISHED IN SEPTEMBER 1958 ISSUE OF PLATING MAGAZINE)

American Smelting & Refining Company
Branson Ultrasonic Corporation
Casalbi Company
Dalic Metachemical Ltd.
Detrex Chemical Industries
Haviland Products Company
Murray-Way Corporation
National Association of Metal Finishers
Service Screw Products Company
Smoothex, Inc.
Univertical Foundry & Machinery Company
Venton Pump & Equipment Corporation

(As of September 19, 1958)

Interior views of the Hotel Statler Hilton in Detroit. (Top) Main Lobby. (Below) Terrace Dining Room.

ROSTER OF INVITED SPEAKERS
FIFTH INTERNATIONAL CONFERENCE
on
ELECTRODEPOSITION AND METAL FINISHING

Supplement to list in September 1958 issue, Plating Magazine

COUNTRY	AFFILIATION	SUBJECT
ENGLAND A. A. B. Harvey	*Vauxhall Motors Ltd.*	A Critical Study of Accelerated Weathering of Organic Finishes
FRANCE Robert Mondon	*Societe Jacquet-Hispano Suiza*	Status of Electropolishing in Europe
GERMANY H. Guinsberg	*Scientist*	Developments in Coating of Aluminum and Its Alloys
HOLLAND P. Baeyens	*Scientist*	Passivation of Metals
ITALY F. Sacchi	*Scientist*	Accelerated and Exposure Tests on Nickel-Chromium Plated Aluminum
UNITED STATES H. W. Howard	*Shell Chemical Corp.*	Epoxy Resins

INTERSOCIETY NEWS

ASME ELECTS GE'S WARREN PRESIDENT

Glenn B. Warren, vice president and consulting engineer of the turbine division, General Electric Co., has been elected president of The American Society of Mechanical Engineers.

Elected to serve with Mr. Warren were five vice presidents. They are: Charles H. Coogan Jr., head of the mechanical engineering department of the University of Connecticut; Gordon R. Hahn, assistant chief mechanical engineer for Gibbs and Hill, New York; John W. Little, president of the Goslin-Birmingham Manufacturing Company, Alabama; Thomas J. Dolan, head of the department of theoretical and applied mechanics at the University of Illinois; Harold Grasse, partner in Black and Veatch, Kansas City, Mo.

All the electees will take office at the business meeting on the first day of ASME's Annual Meeting in New York, December 1–5. Mr. Warren will serve, for a one-year term, the vice presidents, with the exception of Professor Coogan who is filling an unexpired term, for two years, and the directors for four.

PLASTICS ENGINEERS PLAN 26 TECHNICAL SESSIONS

"Worldwide Advances in Plastics" is the theme of the 15th ANTEC to be held in New York City at the Hotel Commodore, January 27 through 30, 1959, by the Society of Plastic Engineers.

The program committee has scheduled a session on the subject of Blow Forming. Qualified speakers will cover techniques, physical properties of blow-formed pieces, research to date, tools for blow-forming and the results of a current market study in this field.

The subject of the first session is Latest Developments in Stereo-specific Polymers. Prof. Herman F. Mark of Polytech Institute of Brooklyn is moderator.

The second session will cover Topics of Special Interest. Dr. Robert B. Mesrobian, Assoc. Director of Research, Brooklyn Polytechnic Institute, will moderate this session.

There will be a session on Thermoforming and two sessions on Extrusion.

The fifth session is under the moderation of Saul Blitz and will present "High Frequency Preheating and Plunger Molding of PVC and other heat sensitive Thermo-plastics" and "Temperature and Pressure Relationships in the Extrusion and Injection Molding Processes." Part II of the Injection Molding sessions will be led by Dr. Gerard C. Heldrich of Grace Chemical Co., Clifton, N. J.

Vinyls have always found their way into Conference discussion and presentation, but this year an entire session will be devoted to this material. The papers presented will focus attention on "Vinyl Resins", "Vinyl Stabilizers", "Vinyl Plasticizers", and "Organosols and Plastisols".

There will be two sessions on Mold Design. One will be presided over by Earnest Csaszar of Newark Tool & Die, the other by John A. Kavanagh of Standard Tool Co. There are many other important subjects on the program.

The subject for session 19 is Ultra High Temperature Reinforced Plastics.

SHOP OWNERS FORM WESTERN N. Y. GROUP

Thirty metal finishing shop owners and operators were on hand, Sept. 12, at the Buffalo Statler Hotel, to witness the charter presentation to the NAMF of Western New York by George W. Taylor, president of the National Association of Metal Finishers. The charter was received by Harold M. Karet, president of Keystone Chromium Corp., Buffalo, the temporary president of the 13th affiliate of the NAMF.

Charter Night program chairman was Edward N. Marlette, president of Marlette Plating Co., Buffalo, a national director of the NAMF who also spearheaded the organization of the NAMF of Western N. Y. Special guests included members of the NAMF Board of Directors who held their quarterly meeting in Buffalo during the day.

TAYLOR NAMES NAMF COMMITTEES AND CHAIRMEN

Nearly 70 industry members were named to 14 committees of the National Association of Metal Finishers by NAMF president, George W. Taylor.

The chairmen appointed for 1958–59 are:

Standards Committee: John T. Hyduke, Durable Plating Co., Cleveland.

Educational Committee: A. T. Leonard, Superior Plating, Inc., Minneapolis.

Educational Subcommittees: Ethical Practices—Harry Brown; Costs—Edward N. Marlette.

Government Liaison: David J. Griffin, Birmingham Plating Works, Birmingham, Ala.

Industry Liaison Committee: Chairman, John Palik Jr., National Plating Corp, Cleveland.

Membership-Public Relations Committee; Harry M. Saltzberg, Modern Electroplating Co., Inc., Roxbury, Mass.

Strategic Materials Committee: Mariano Ranno.

Constitution and By Laws Revision Committee: James E. Cogan Jr.

Awards Steering Committee: Clyde Kelly.

Detroit Convention Committee: Glenn H. Friedt Jr.

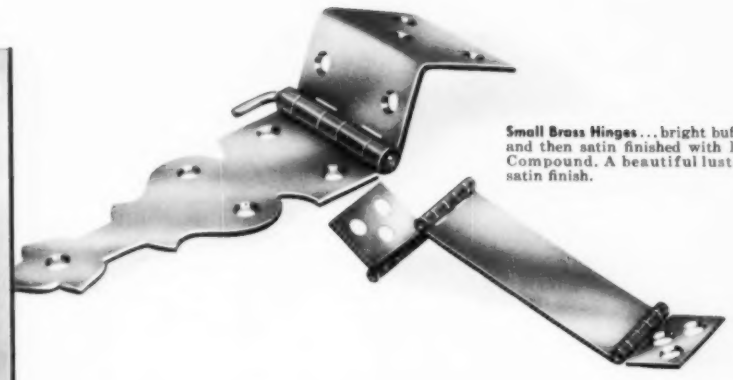
Los Angeles Convention Committee: Harold E. Coombes, Sr., Crown City Plating Co., El. Monte, Calif.

Parliamentarian: G. David Zeile, Plating Trades Assn. of Ohio.

National Charter presented to Harold M. Karet, center, temporary president of the NAMF of Western New York, by George W. Taylor, left, president of the National Association of Metal Finishers. NAMF Board Member and Charter Night Program Chairman Edward N. Marlette, right.

INDICATE B 1101 ➤

Stainless Steel Hinge... satin finished with 220 grit Lea Compound.



Small Brass Hinges... bright buffed and then satin finished with Lea Compound. A beautiful lustre-satin finish.

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Lea Mfg. Company of England, Ltd., Buxton, England
Lea-Ronal, Inc., Main Office and Laboratory: 139-20 109th Ave., Jamaica 35, N. Y.
Manufacturing Plant: 237 East Aurora St., Waterbury 20, Conn.

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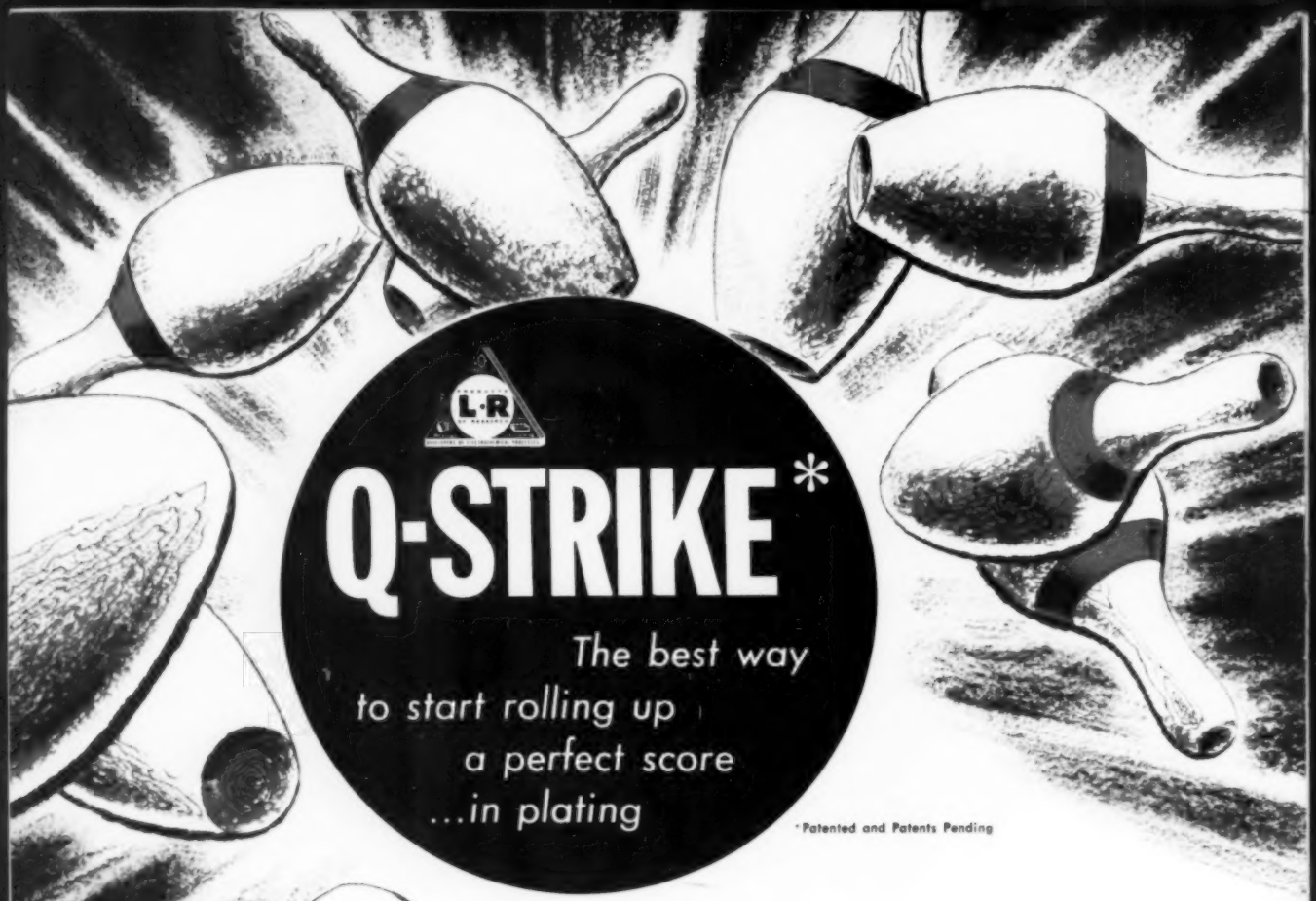

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- produces a superior foundation deposit needed for high quality plating
- unlike the conventional copper strike that tends to reproduce the surface of the base metal, Q-STRIKE produces a refined, oriented crystal deposit that hides surface imperfections.
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- similar benefits where nickel is deposited immediately after the copper strike.
- reduces materially the troubles associated with copper strikes as well as increases tolerance to metallic contaminants and carbonates.

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Cleaning and Preparation of Metals for Electroplating, IV, V, VI & VII—By H. B. Linford & E. B. Saubestre — *Serial 26 Project 12* **$3.50**

Methods for Testing Thickness of Electrodeposits, II & III—By H. J. Read & F. R. Lorenz — *Serial 27 Project 7* **$1.35**

Porosity of Electrodeposited Metals—By N. Thon, D. G. Kelemen, L. Yang, S. Yang, D. Dean — *Serial 28 Project 6* **85 Cents**

The Analysis of Electroplating Solutions for Major Constituents—By E. J. Serfass & M. H. Perry — *Serial 29 Project 2* **90 Cents**

Effect of Basis Metal Condition on Plating, I & II—By A. E. R. Westman & F. A. Mohrnheim — *Serial 30 Project 14* **$1.10**

Effect of Surface Finishing of Nonferrous Base Metals on Protective Value of Plated Coatings—By G. J. Kahan, W. W. Macchia, J. M. Fairbank — *Serial 31 Project 4* **45 Cents**

How the Small Electroplater Can Treat Cyanide Plating Waste Solutions with Hypochlorites—By Barnett F. Dodge and Walter Zabban, Yale University, New Haven, Connecticut — *Serial 33 Project 10* **50 Cents**

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The Nature, Cause and Effect of the Porosity in Electrodeposits, I & II—By Fielding Ogburn, Asaf Benderly and Margaret Hilkert — *Serial 36 Project 13* **$1.00**

Microthrowing Power, A Literature Search—By Esther B. Leffler and Henry Leidheiser Jr. — *Serial 37 Project 17* **75 Cents**

The Influence of the Physical Metallurgy and Mechanical Processing of the Basis Metal on Electroplating IV—By M. H. Jones, Chih-Yeu Lu and J. Zajdowski — *Serial 38 Project 14* **$1.25**

Mechanical Finishing of Metal Surfaces—Bibliography—By C. E. Kennedy, J. E. Fritts, R. S. Modjeska, L. E. Weeg & R. V. Twyning — *Serial 39 Project 18* **50 Cents**

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CADMIUM per lb	$1.55
COPPER	
Cast elliptical, 18 inches or longer, 5000 lb lots	41.50
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BRASS, 80-20, ball anodes, 2000 lb or more	45.50
ZINC, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
NICKEL, 99 pct plus, rolled carbon per lb (rolled depolarized add 3¢ per lb)	$1.0225
TIN, ball anodes, per lb approximately	$1.05

(Cents per lb. unless otherwise stated, freight allowed in quantity)

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GOLD, U. S. Treas., per oz	$35.00
INDIUM, 99.9 per cent, per troy oz	$2.25
LEAD, New York, cents per lb	12.40
PALLADIUM, per troy oz	$15 to 17
PLATINUM, per troy oz	$57 to $60
RHODIUM, per troy oz	$120 to $125
SILVER, New York, cents per troy oz	89.875

Chemicals

BORIC ACID, 100 lb bag N. Y.	10.50
CADMIUM OXIDE, 100 lb drum per lb	$1.45
CAUSTIC SODA, 100 lb drum N. Y.	8.50
CHROMIC ACID, flake type, 100 lb drums	31.00
COPPER CYANIDE, 100 lb drum	66.20
COPPER SULFATE, 100 lb bags, per cwt	22.15
NICKEL CHLORIDE, freight allowed, 300 lb.	82.25
NICKEL SULFATE, 100 lb.	45.00
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POTASSIUM STANNATE, 100 to 300 lb drums	85.70
ROCHELLE SALTS, 250 lb	48.00
SODA ASH, 100 lb.	9.10
SODIUM CYANIDE, domestic, f o b N. Y., 200 lb drums	23.05
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ZINC CYANIDE, 100 lb	60.75
ZINC OXIDE, American process, lead free, 100 to 500 lbs.	15.5

(Cents per lb, f o b at point shipped)

Prices in effect October 10, 1958

These prices, while derived from authentic sources, may be expected to vary by geographic location, quantity purchase, FOB and other terms, market influences and variations. They are presented solely as a general guide.

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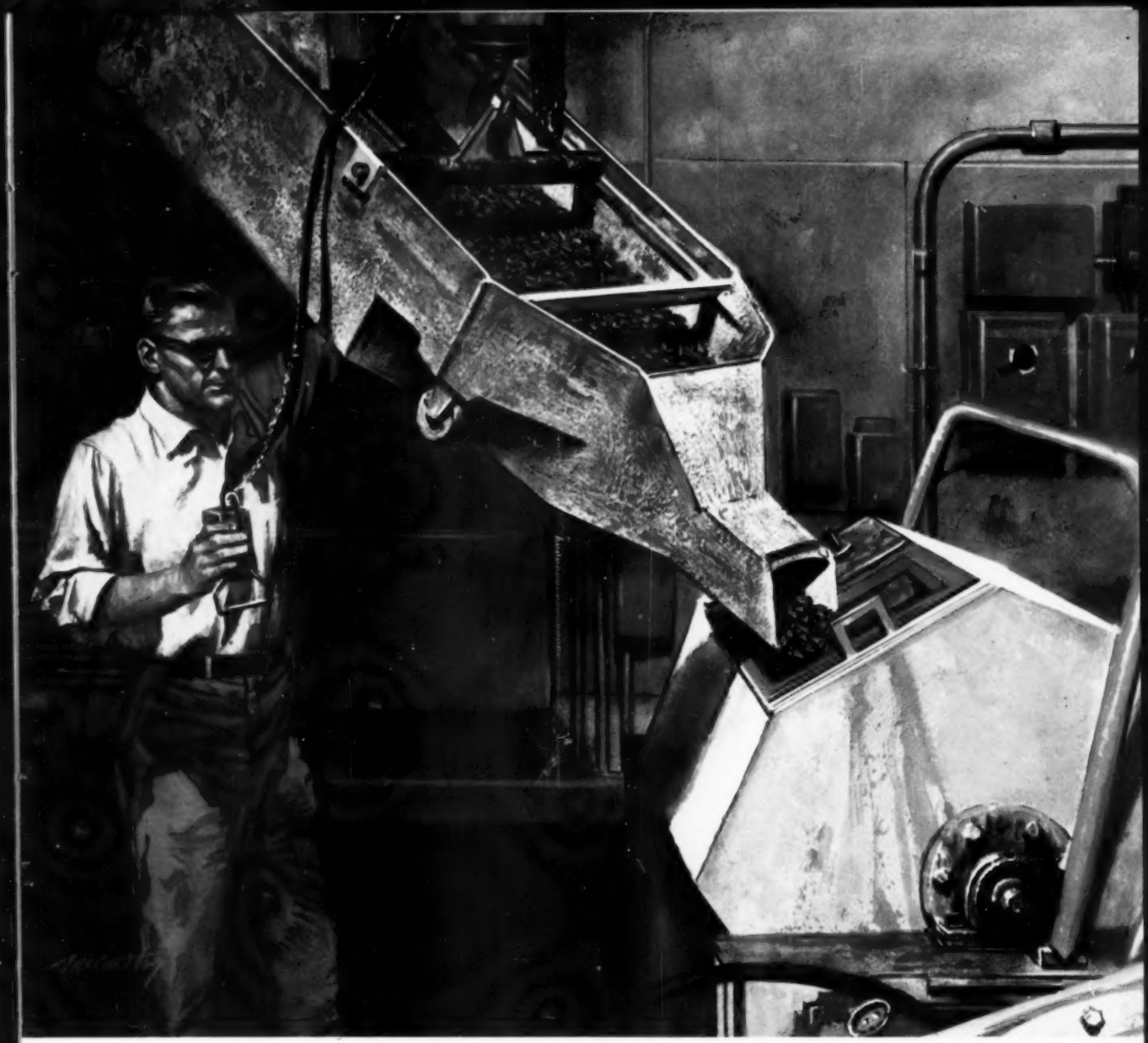

The "Touch of Gold" is going into this barrel

. . . because the operator is adding Norton TUMBLEX abrasive, widely recognized as an unequalled contribution to better, lower cost finishing. For example, after shifting from hand finishing to barrel finishing with ALUNDUM TUMBLEX "T" abrasive, a leading aircraft parts manufacturer reports yearly savings of over $90,000. Norton brings this value-adding, profit-increasing "Touch of Gold" to industry in the widest range of grinding, cutting, polishing and tumbling operations . . . by the most complete line of abrasives . . . backed by world-wide resources and services.

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ALCOA ALUMINUM BUS CONDUCTOR DOES DOUBLE DUTY AS STRUCTURAL COMPONENT

Several significant savings were effected by Master Anodizers and Platers, Inc., when they chose bus conductor of Alcoa® Aluminum for a new anodizing rack in their Bedford, Ohio, plant.

There were savings in initial cost: compared to a comparable copper system, they got the same conductivity from approximately half as many pounds of metal. Savings in installation costs: aluminum's light weight made it easy to handle and fabricate. Finally, there were savings in structural components: the 7-in. channel bus also serves as the support for the anodizing rack.

These savings are typical with bus conductor of Alcoa Aluminum. A wide variety of bus conductor sizes and shapes is available from Alcoa. Immediate delivery of rectangular bus conductor in popular sizes is available from your Alcoa Distributor. Call him before completing plans for plant modernization or expansion. Or write: Aluminum Company of America, 2313L Alcoa Building, Pittsburgh 19, Pennsylvania.

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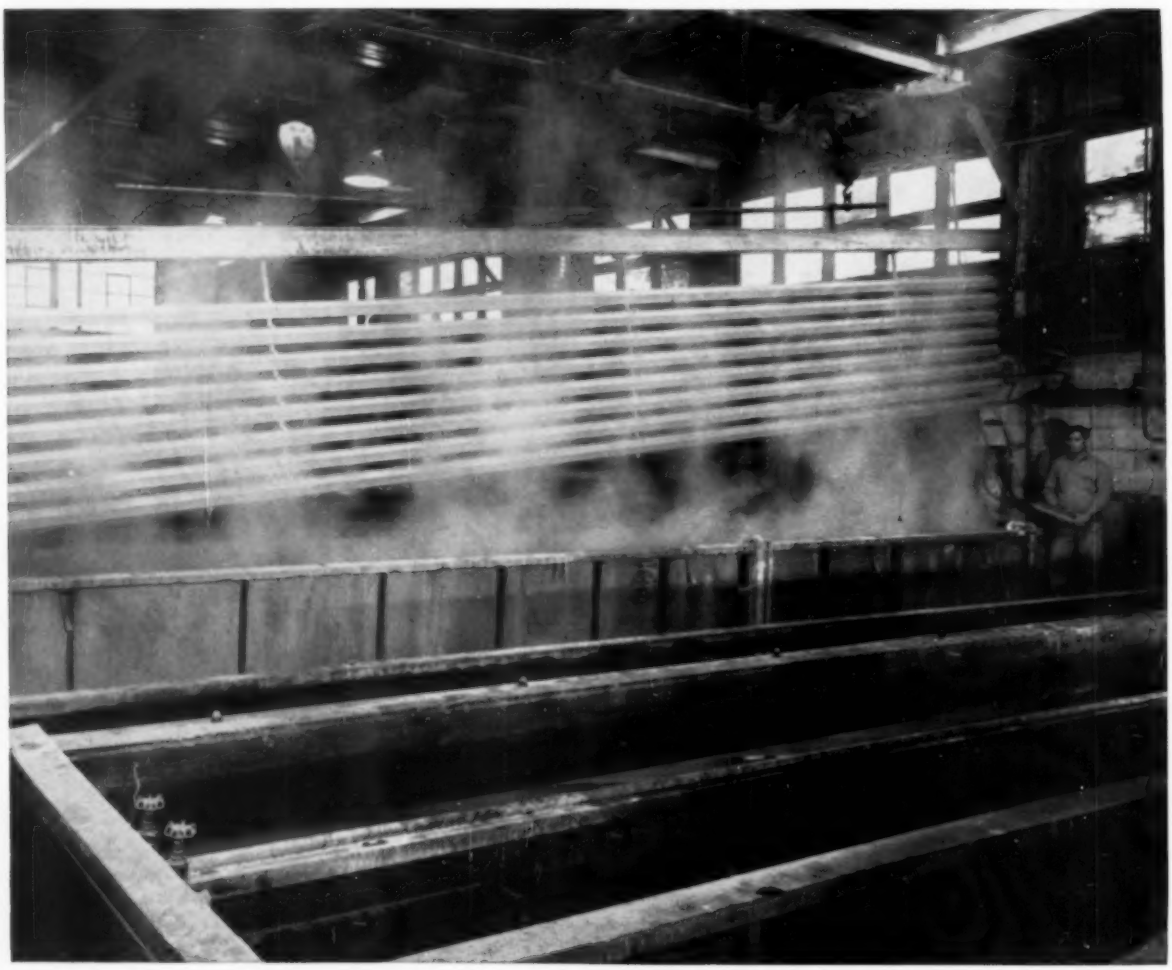
Double duty: Alcoa Aluminum Bus Conductor is serving as a support for this anodizing rack, while conducting 5,000-amp power for the operation.



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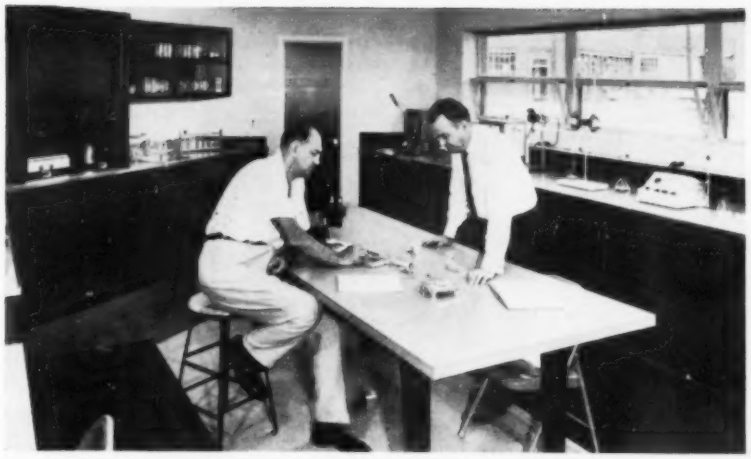
INDUSTRY NEWS



Wallace L. Reed, Abrado president, left, and C. Heamon Castle, vice president.

ABRADO FINISH NOW NATIONAL

The Abrado Finish Corp., formerly the Grand Rapids Tumbling Supply Corp., has just completed the addition of over 10,000 sq ft of new offices, experimental laboratories, and manufacturing facilities to their plant located at 1750 Elizabeth Avenue, N. W., Grand Rapids, Michigan.

Several months ago the name Abrado Finish Corp. was adopted to replace the former name used by the company since its founding in 1954 by Wallace L. Reed.

C. Heamon Castle is associated with Abrado as executive vice president and technical director. Mr. Castle's background includes that of technical director for another supplier of barrel finishing materials, and he has devoted the last 25 years to process development for the metal finishing trade. He graduated from Michigan College of Mines and Technology with a degree in metallurgical engineering and has written several technical papers on barrel finishing published in national magazines.

Abrado Finish Corp., in addition to supp'ying chemical compounds and abrasive media, is developing several new types of metal finishing equipment and accessory items. A new and different spindle type finishing machine will shortly be announced by Abrado.

UDYLITE INITIATES POSITIVE PROGRAM

The Udylite Corporation, of Detroit, Michigan, is setting a new pace for American industry to follow in challenging the recession with a positive program which the firm hopes will be carried forward on an industry-wide basis.

Clyde H. Reeme, Udylite president, characterizes "Project Alert" as a dynamic philosophy. "The goal is to sweep industry with a program of continual vigilance reaching into every plant and office, engineering and production department and sales department to create the magic of enthusiasm that will set us on our way again."

The project suggests a change in attitude, according to Mr. Reeme. This change, he continues, primes salesmen to tell customers about the real advantages of buying now, alerts employes to discover ways to cut production costs by streamlining organization and finding new methods.

Udylite salesmen are telling their customers that now they have the time, seldom available, to modernize equipment and processes.

The sales force is backstopped in "Project Alert" by several changes in the Udylite organization which include expanded service in the field and a special department to assure fulfillment of the promises for prompt and complete delivery on all orders.

A broad continuing program is planned by Udylite to sell "Project Alert" to American industry. This includes editorial-type advertisements in national trade papers, distribution of "Project Alert" buttons by Udylite salesmen to executives and production personnel and direct mail pieces and sales kits.

SOLVAY EMPHASIZING NEW PRODUCT DEVELOPMENT

Accelerated emphasis on developing new product uses and applications has been underscored by Solvay Process Division, Allied Chemical Corp., in assigning personnel to newly-created posts in Solvay's research department at Syracuse, N. Y.

Dr. Robert H. Reed is appointed director of research, Dr. Herbert C. Wholers becomes assistant director joining the two present assistants, Dr. Howard A. Bewick and Dr. E. Westley Smith, and Dr. Arlie P. Julien is named chief of application research.

In making the announcement, Arnold Hanchett, Solvay's director of develop-

New research center of Diamond Alkali Co., Cleveland, Ohio, will be located on landscaped 800-acre site in Concord Township, O., just a few miles south of company's Painesville plant and present research facilities at Fairport. Shown are models of Central Research buildings as visualized and designed by the architects. The multi-unit project, according to Raymond F. Evans, Diamond's chairman and president, "marks an integral part of a long-range research and development expansion program by Diamond to meet anticipated future growth needs and to maintain its position in the chemical industry."

ment, cited the recent statement by Dr. Glenn A. Nesty, Allied Chemical vice president in charge of research and new product development.

Dr. Nesty said in part, "Today's changing markets, rapidly advancing technology and increased competition present special challenges to the managements of chemical companies in making long-range plans for dynamic growth.

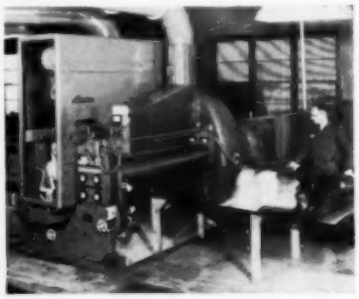
"These conditions require Allied, more than ever before, to depend on effective research to increase sales and earnings." The corporation spent approximately $17.5 million last year for research.

DEVELOPMENT DEPARTMENT CREATED AT METAL & THERMIT

In order to place major emphasis on the planning and development of new products, Metal & Thermit Corp., New York, has recently widened the scope of its development activities.

To be known as M. & T.'s development department, reporting direct to H. E. Martin, the company's president, this department is now not only responsible for market development and market research, but also for product development, a new technical activity being conducted at the M. & T. research center in Rahway, New Jersey. H. E. Hirschland, former manager of market development has been named director, and C. H. Carpenter, formerly technical advisor to the president, is manager.

While development of new chemicals and metals will be stressed, the work of the department will encompass all of M. & T.'s present product lines, including electroplating products, organic coatings, welding supplies and equipment, and products for the ceramic industry.



Start of a 70 in. job through new flat polishing machine.

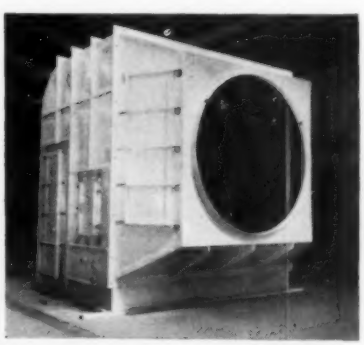
PRODUCTION FINISHING ADDS MACHINE FOR WIDE POLISHING

Installation of new, specially built equipment capable of polishing sheet or flat metal surfaces up to 72 inches wide has been made by Production Finishing Corp., Detroit.

This "pinch-roll" or through-feed type machine will handle 76-in. carbon steel, stainless steel, aluminum and other metal stock. The automotive, major appliance and aircraft industries are expected to be the most frequent users of the equipment.

The giant polisher is 71 per cent wider than Production Finishing's previous polishing width capacity of 42 inches. Both are the widest in the eastern industrial midwest.

The machine was custom built for the company by Acme Manufacturing Co. of Detroit.



One of the largest solid plastic structures ever built for handling and scrubbing corrosion fumes. This washer was built by Heil Process Equipment Corp., Cleveland.

The best way to know the results of your industrial waste treatment is to have a permanent record. The kind you get with a W&T O-R-P system

WALLACE & TIERNAN O-R-P SYSTEM... the sure way to treat poisonous plating wastes

The destruction of cyanides with alkaline chlorination is a controlled certainty. A W&T Oxidation-Reduction Potential (O-R-P) system, automatically controls waste treatment and records the results.

Why use an automatic system? Because there is no overfeeding of chemical; no uncertainty of effluent safety. An O-R-P system samples the treated waste, controls the feeding of the treatment chemicals and records the effectiveness of the treating process.

That's why the sure way of treating your industrial waste effectively is with an O-R-P controlling and recording system. To get the O-R-P story and learn how it works in a major industrial plant, write for Bulletin I-63.75.

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INDUSTRY NEWS BRIEFS

BUREAU OF MINES RESEARCH PROGRAM FOR NICKEL AND COBALT

Metallurgical studies to develop efficient methods for separating and recovering nickel and cobalt as separate products and for preparing extremely high-purity nickel will receive special emphasis in the Bureau of Mines' nickel-cobalt research program during the fiscal year which began July 1, 1958. The program will be carried on at four experiment stations.

As part of its effort to conserve mineral resources, the Bureau will begin research to find ways of using multi-component high-temperature alloy scrap as the basic raw material in preparing standard nickel-base and cobalt-base alloys.

Studies will be accelerated to develop fundamental data on those physical and mechanical properties of cobalt which have the greatest significance for the economical and efficient use of the metal. To permit similar studies on nickel, research will be conducted in preparing this metal in high-purity form.

LEAD AND ZINC GOVERNMENT RESEARCH

Metallurgical studies to develop improved methods for processing complex lowgrade lead and zinc materials now considered submarginal, will be emphasized in the Bureau of Mines' lead and zinc research program during the 1959 fiscal year, the Bureau has announced. The program got underway July 1 at six experiment stations and several field offices.

AIR POLLUTION CONFERENCE

A group of leading scientists and other specialists in fields related to air pollution control have developed plans for the first national conference on air pollution to be held November 18–20 at the Sheraton Park Hotel, Washington, D.C.

The plans call for plenary sessions with addresses by scientists, industrialists and government officials, and group meetings in which recommendations will be formulated for future action. Subjects to be considered will include effects of air pollution on health, control methods, economic factors and other aspects of the problem.

CADMIUM DOWN IN 1958 SECOND QUARTER

Cadmium production in second quarter 1958 was about 2,113,000 pounds, 13 per cent below first quarter, according to the Bureau of Mines, United States Department of the Interior.

Shipments of cadmium was down 17 per cent to 1,468,000 pounds.

Total stocks of metal increased 12 per cent to 4,893,000 pounds for the 3 month period.

Data on general imports of metal and flue dust are estimated to be 30 and 246 per cent, respectively, above first quarter 1958. Exports increased 127 per cent.

GOVERNMENT CATALOG ON ANODIC COATINGS

A *Catalog of Technical Reports* on Anodic coatings has just been published by the Office of Technical Services, U. S. Department of Commerce.

Many of the reports listed in the catalog are the result of research conducted for the Army, Navy, Air Force, and other agencies of the U. S. Government. Others are German documents captured by the Allies during World War II.

CTR-348 *Anodic Coatings*, 1934–58 may be ordered from OTS, U. S. Department of Commerce, Washington 25, at 10 cents.

Brass Plating Calculations

●

Figuring the amount of brass plate to be expected is more difficult than with most single metals. The following are factors which will enable simple figuring of brass plating.

●

For 70-30 (yellow) brass 1 pound requires 246 ampere hours at 100% efficiency. The specific gravity of this brass is 8.53. The coverage of 1 ounce of brass to a thickness of .0001" is 14.08 square feet. A current density of 10.9 amperes per square foot will deposit .001 inches of 70-30 brass per hour at 100% efficiency.

●

When 85-15 (richlow) brass (bronzy color) is plated the figures are changed slightly. 1 pound requires 218 ampere hours at 100% efficiency. The specific gravity is 8.75. The coverage of 1 ounce of brass to a thickness of .0001" is 13.73 square feet. A current density of 9.5 amperes per square foot will deposit .001" of 85-15 brass per hour at 100% efficiency.

●

Brass plating solutions can operate at a wide range of efficiencies. Properly balanced it is easily possible to secure 75% efficiency. Only small deviations from the ideal will drop the efficiency to 15 to 25%. Even zero efficiency is easily achieved as any plater who has had experience can testify. To maintain peak efficiency both of plating and labor True Brite Brass Maintenance materials are the perfect answer. Composed of basic materials and sold at basic prices by a manufacturer of copper and zinc cyanide they will give a new concept of efficiency and dependability. With complete information available you can give your attention to your operations instead of spending several hours every day trying to make your brass plating solution work. True Brite has the answers for you. Send for our bulletin.

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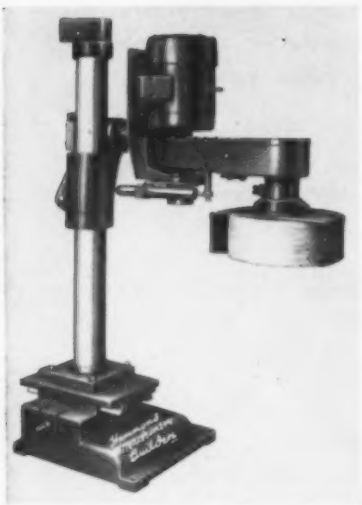


E—1100. Buffing Head—Hammond Machinery Builders, Inc. announce a new heavy duty floating type polishing or buffing head. It is available with 10, 15 or 20 hp motor and multi-v-belt drive. This head is suited to use on rotary automatic turrets or straight line conveyors where floating action on irregular shaped parts is required.

E—1101. Electrostatic Spray System—Development of a centrifugal type multicolor electrostatic spray system was announced by Ionic Electrostatic Corp.

This new system designated as model M-50 is adaptable for producing both single color and multi-color patterns or finishes. The system utilizes an array of variable speed electrostatically charged centrifugal atomizers which blend coating materials to produce various types of multi-color mixed patterns previously unobtainable. Reciprocating and stationary models are available.

E—1102. Bright Dipping Copper and Brass Powders—Two new powders have been announced by Conversion Chemical Corp. for bright dipping copper and brass. Kenvert No. 30-C is designed primarily for copper but may also be used for brass. Kenvert No. 30-B is designed primarily for brass, but can also be used for copper.

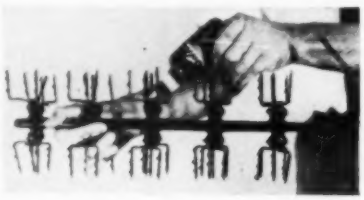
These new powders, mixed with water produce a bath that is said not to fume, is stable, and permits easy control. The finished surface, after brightening, is passive.

Kenvert No. 30-C is claimed to be suited for neutralizing copper plated parts before subsequent plate. It will work on cyanide or acid plated copper surfaces. Kenvert No. 30-B is a base for lacquer.

E—1103. Metal Cleaner—A nonflammable phosphoric acid type cleaner and deruster for most metals has been developed by Enthone, Inc., a subsidiary of American Smelting and Refining Co. Named Enthol 59, the new product is a blend of phosphoric acid with emulsifiers, solvents and penetrants which is claimed to rapidly remove rust, metal oxides, oil and grease from metals in one operation. Additionally, it leaves a light phosphate film on steel and zinc—base for painting or other organic finishing.

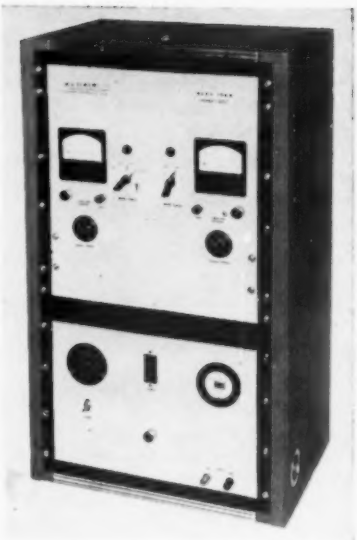
Enthol 59 can be used hot or cold and can be applied by dipping, brushing, swabbing or spraying. The working solution is made up by diluting one volume of Enthol 59 with up to nine volumes of water. It can be operated at temperatures up to 180F cleaning without excessive loss of solvent due to evaporation. Despite its high phosphoric acid content, Enthol 59 is inhibited against attack of iron or copper alloys.

Enthol 59 also can be used to strip residual paint and enamel from parts being prepared for repainting.



E—1104. Plastisol—A new plastisol is announced which it is claimed can be sprayed, painted or dipped in coatings of 40 mils or more, for plating rack development, patching or general protective maintenance. The material is said to adhere to any metal, or other coatings regardless of how applied, producing a tough, noncontaminating insulator-surface. Requiring no ovens, special skill or facilities to apply, coatings air-dry for use in approximately 30 min.

According to the manufacturer, Sel-Rex Corp. a "Squeez-on" applicator, filled with a generous trial quantity of the plastisol "armor," will be supplied free with initial orders—while the supply lasts.

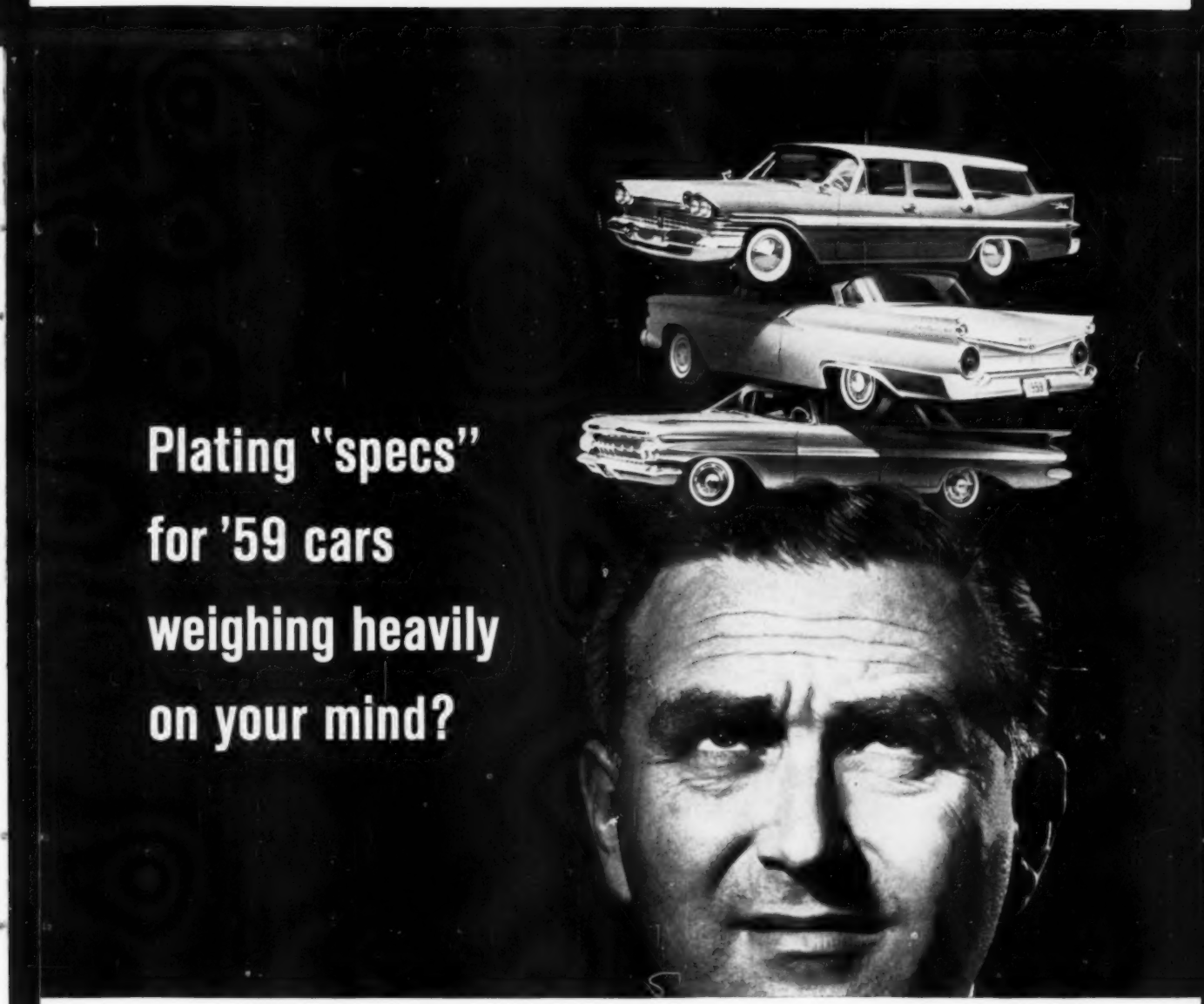


E—1105. Power Supply Regulator—The Model HCVS-106-A constant current and constant voltage automatic switchover regulated power supply, manufactured by Matthew Laboratories, is designed for the controlled application of Faraday's Law where quantitative coulomb or electric charge transfer or material deposition or removal is to be effected. Applications are the forming of condensers, controlled and precise electroplating and etching, and other electrolytic processes.

A principal characteristic is the automatic switchover feature. On constant current operation, the supply automatically switches to constant voltage operation when the output voltage reaches a selected predetermined value due to buildup of load resistance. The output current range is adjustable from 0–20 amps and the output voltage range is adjustable from 0–100 v.

E—1106. Oxidizing Process—Patent has been applied for by the All-Brite Chemical Corp. to cover a substitute for anodizing called Anobrite, a chemical oxidizing process. It is said to be less expensive than anodizing, yet obtains colors similar to anodizing. It can be done in a basket and it is claimed to produce a bright finish which has shown corrosion resistance.

E—1107. Bright-Silver Process—A new bright-silver plating process claimed to impart a premanently hard, mirror finish in



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Unichrome Bright Crack-Free Chromium not only helps you avoid rejects in plating new and unfamiliar parts, but also multiplies corrosion resistance.

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Unichrome Crack-Free Chromium baths are self-regulating. You don't need constant chemical analyses to keep these "automated" solutions in proper balance for perfect plating.

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both flash and heavy deposits, yet faster and easier to use than processes available heretofore, is being put on the national market by the American Platinum & Silver Division of Engelhard Industries, Inc.

Applications of the process, called Silva-Brite, include aircraft bearings, busbars, waveguides, and jewelry. Equally good results are said to be obtained in both barrel and regular tank plating.

The process was described as offering relatively fast plating speeds. In addition to speeding automation, this feature makes it unnecessary for the plater to raise his solution above room temperature (75F). Since at low temperatures the plating bath has less tendency to decompose, carbonate buildup and cyanide fumes are minimized.

The manufacturer said that Silva-Brite gives a true mirror-bright finish (100 per cent specular reflection) through the complete range from flash to heavy deposits.

E—1108. Rhodium Concentrate—Rhodium Sulphate TP is an improved new rhodium concentrate recently introduced by Technic, Inc.

Lower stress, higher purity and finer grain are cited as advantages which make the new Technic concentrate especially suitable for chemical, electrical, electronic, nucleonic and other design applications.

To enable prospective users to appraise the potential of Rhodium Sulphate TP, Technic presently is making available a test quantity of 10 g, with complete instructions, at a special sampling price.

E—1109. Phosphate Coating—Development of a new phosphate material for use as an anti-friction "break-in" coating and as a foundation for oil or paint has been announced by Turco Products, Inc. Called Turcoat 3557, the new material provides a phosphate coating of up to 3000 mg/sq ft on iron, steel or cadmium. It is applied by immersion or tumbling and meets MIL-C-12968 (ORD), Type B; USA-57-O-2C, Type II, Classes A, B and C; and JAN-C-490, Grade I. The coating applied is one of mingled manganese, zinc and iron phosphates.

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SIR ISAAC NEWTON

(Continued from page 1146)

It is another peculiarity of rockets, that there is a limit to the amount of velocity you can get in a single rocket stage from any given combination of propellants. If you want to exceed this, you have to go to a better combination of propellants or staging. We had available in this country several combinations of propellants which had demonstrated that they were as efficient as any that were known in the world, and we believed that we knew how to make light weight rockets.

In the Navy proposal, the use of the Army's "Hermes Project" engine developed by the General Electric Company was decided upon; however, even in this present power-plant changes had to be made. The Hermes Engine called the X400 was a high performance liquid oxygen and alcohol engine, with length of burn time somewhat under the Vanguard's required time. The General Electric Company's Rocket Engine Section designed, developed, tested and manufactured a revised engine called the X405 using many X400 parts; however, with a different fuel combination and other engineering changes. This engine gave the necessary thrust of approximately 27,500 pounds and had the required burn time of approximately 140 seconds.

For the second stage the Navy went to the Aerojet Company for the engine, a type which was used in the Aerobee-Hi Rocket. This engine would burn a combination of unsymmetrical dimethylhydrazine as fuel, and nitric acid to act as the oxidizer. The two fluids are hypergolic and upon contact with each other burst into flame, thus, eliminating the problem of high altitude starting.

The 3rd Stage was to be a solid rocket of very high performance to be developed by the Grand Central Rocket Company, and the Allegheny Ballistic's Laboratory.

At this time the Vanguard Program has successfully put an instrumented satellite in orbit that, at this very moment, is sending vital information to Minitrack Stations throughout the world. This satellite is revolving around our earth at the highest orbit of any known satellite thus far launched.

I am sure our country will be successful in putting up many more. Our satellites don't yet weigh 3,000 pounds, and we have a long way to go before we put any that size up, but we can gather considerable information at much lower cost by launching many small ones.

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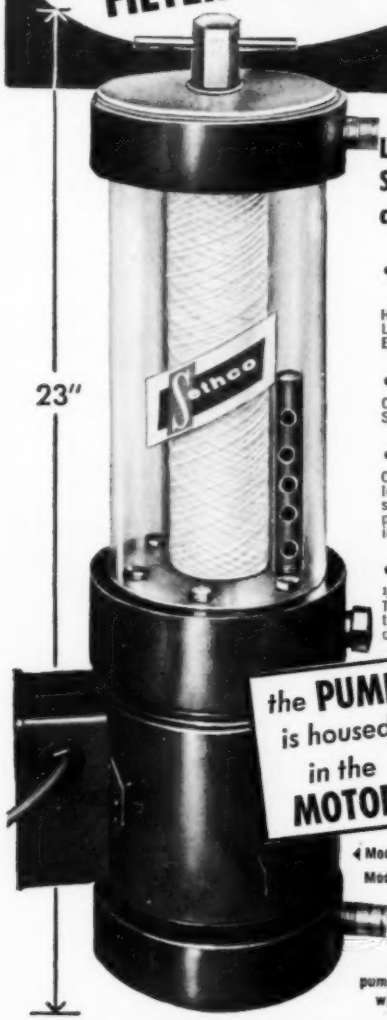
Sethco all-in-one FILTER PUMP UNIT

150 GALS. PER HR.



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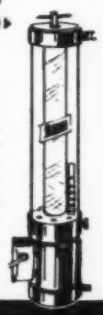

OTHER 'canned' pump models with ¾ HP motors available for filtering up to 1800 gals. per hour.

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PATENT ABSTRACTS

DR. D. GARDNER FOULKE
Manager, Electrochemical Development
Hanson-Van Winkle-Munning Co
Matawan, New Jersey

Copies of patents may be obtained by writing to Commissioner of Patents, Washington, D. C. Price 25 cents each.

No. 2,841,548, 7/1/58—Electrode Holder—D. Perlman, Beaumont, Calif.

An electrode holder for supporting a dental impression electrode is described.

1 claim, figure.

No. 2,841,549, 7/1/58—Electroplating Hanger—G. B. Hogaboom Jr., Kenilworth, N. J.

A rack for suspending a multiplicity of small articles described as "a hanger for suspending a multiplicity of articles in an electroplating tank, said hanger comprising a linear body provided by a plurality of contiguous electrically conductive wire strands helically twisted together at intervals along the length of the body to form spaced apart interlocked sections, with selected strands parted intermediate the interlocked sections to provide free end portions extending from the ends of said sections, said free end portions being bent into upwardly open article receptive hook members projecting laterally from the linear body, and an end portion of said linear body terminating in an inverted hanger hook formation to suspend said body from a cathode rod of an electroplating tank.

3 claims.

No. 2,842,457, 7/8/58—Decorating Composition—J. Morgan and C. Wagner, assignors to E. I. duPont de Nemours and Co., Wilmington, Del.

A thermosetting precious metal decorating composition consisting of a precious metal resinate (terpineol sulfide and cyclic terpene mercaptan resinates) a flux, a thermosetting epoxy resin all dissolved in solvent is placed on a ceramic body which is subsequently heated to set and finally fired.

8 claims.

No. 2,842,461, 7/8/58—Lead Coating Process—H. Wagner, et al, assignors to E. F. Hauserman Co., Cleveland, Ohio.

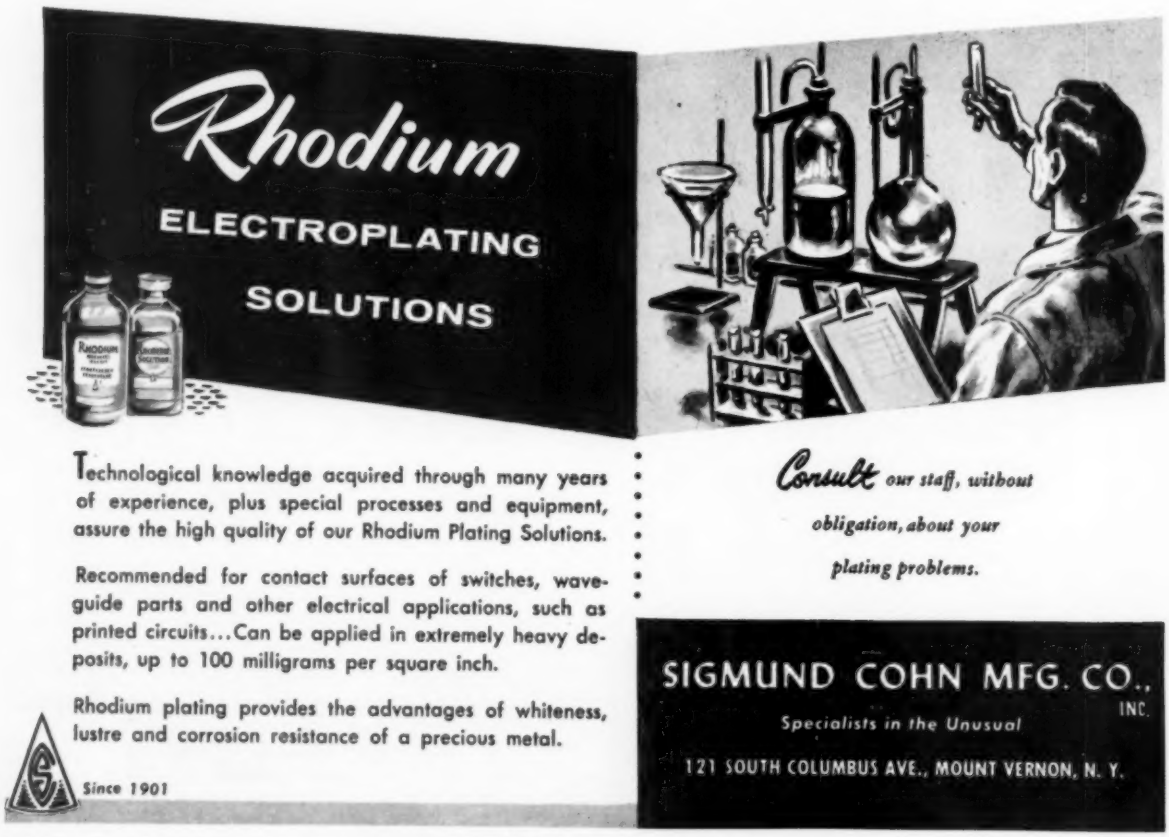
Lead is plated on ferrous articles out of a water solution of lead formate and a water soluble condensation product of ethylene oxide and an organic compound by chemical displacement. The *p*H is given as 2.5 to 5 and the lead ion as 1–80 g/l.

4 claims.

No. 2,842,487, 7/8/58—Dull Nickel—D. Carr, assignor to Bart Laboratories, Inc., Belleville, N. J.

The use of o-formyl benzene sulfonic acid (benzaldehyde sulfonic acid) is described as useful for producing a dull nickel plate with special properties, i.e., compressive stress and high hardness values (440-710 Vickers).

7 claims.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ARTICLE REFERENCES

By
WILLIAM TUCKER
Eastman Kodak
Rochester, N.Y.

Most of the articles listed here may be obtained by writing to the publications in which the articles were published. Addresses are given at the end of the references for the reader's convenience.

Photostat or microfilm copies of articles in available magazines may be obtained from: Library of Congress, Washington, D. C.; New York Public Library, New York; Engineering Societies' Library, New York, at prevailing rates. In other cases, consult Wilson's Union List of Serials at your nearest public library for other sources of these articles.

129. ANODIZING

a. STUDIES OF THE ANODIC BEHAVIOR OF ALUMINUM. 1. THE DIRECTION OF IONIC MOVEMENT.
John E. Lewis and Robert C. Plumb.
Journal of the Electrochemical Society, *105*, No. 9, September 1958, pp. 496–506.

130. COPPER

a. ELECTROLYTIC COPPER PLATING FROM AMMONIACAL ELECTROLYTE FOR LOCAL PROTECTION OF THE SURFACE OF STEEL ARTICLES IN THE CEMENTATION (CARBURIZATION) PROCESS.
N. A. Marchenko.
Journal of Applied Chemistry of the USSR., *30*, 1957, pp. 255–260. (Translation by Consultants Bureau, Inc.).

131. CORROSION

a. NEW CORROSION INDEX SHOWS NATION'S RUST PATTERN.
The Iron Age, *182*, No. 9, August 28, 1958, pp. 54–56.

132. ELECTROPOLISHING

a. ELECTROPOLISHING—WHAT, HOW AND WHY.
John F. Jumer.
Metal Finishing, *56*, No. 9, September 1958, pp. 60–63.

133. ENGINEERING

a. PLATING ROOM LAYOUT.
G. R. Kentta.
Metal Finishing, *56*, No. 9, September 1958, pp. 52–56.

134. MISCELLANEOUS

a. "FIDO" THE WATCH DOG—AN ELECTRONIC SAFETY DEVICE FOR PERIODIC REVERSE PLATING.
B. T. Neill and K. E. Langford.
Electroplating and Metal Finishing, *11*, No. 8, August 1958, pp. 269–271.

135. NICKEL

a. BRIGHT NICKEL PLATING.
A. M. Ozerov.
Journal of Applied Chemistry of the USSR, *30*, 1957, pp. 61–69. (Translation by Consultants Bureau, Inc.).
"In the electrodeposition of Ni by different types of electric current, use of alternating current is advantageous. Hypothesis to explain the formation of smooth, bright Ni coatings of low porosity by use of a pulsating current periodically varying in magnitude, and of an alternating current with an anodic component."

b. THERMAL SHOCK RESISTANT NICKEL PLATING ON COPPER.
L. Missel.
Metal Finishing, *56*, No. 9, September 1958, pp. 49–51.

136. ORGANICS

a. IMPROVING PAINT ADHESION ON PHENOLIC SURFACES.
Metal Finishing, *56*, No. 9, September 1958, pp. 57, 63.

b. REDUCING SPRAY PAINTING COSTS.
J. Arthur Weed.
Metal Finishing, *56*, No. 9, September 1958, pp. 58–59, 63.

c. SCIENCE FOR THE COATINGS TECHNOLOGIST. PART XI. PAINT ADDITIVES: DRIERS AND ANTI-SKINNING AGENTS
E. S. Beck.
Metal Finishing, September 1958, *56*, No. 9, p. 64–66.

d. THE ART OF COLOR MATCHING.
John C. Holle.
Products Finishing, September 1958, pp. 64–82.

Electroplating and Metal Finishing
15 Udney Park Rd.
Teddington, Middlesex
England

Iron Age
Chestnut & 56th St.
Philadelphia 39, Pa.

J. Electrochemical Society
1860 Broadway
New York 23, N. Y.

J. Institute of Metals
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London, S.W. 1, England

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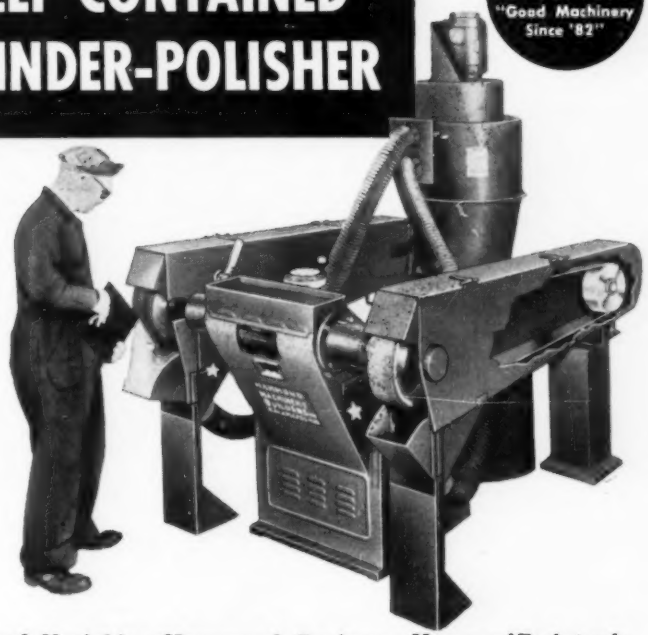

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TRADE LITERATURE

L—1100. Chemical Processes—Chemical processing is the subject of a six-page color bulletin made available by Graver Water Conditioning Co. The bulletin details the equipment and services available in the field of chemical processing.

Among the processes which Graver is offering and which are described in the bulletin are ion exchange, sedimentation, filtration and flotation. Equipment for each of these is illustrated and described. Graver recently announced the expansion of its chemical processing program.

L—1101. Plating Bath Heat—Bulletin GER-1333—four-page article by General Electric discusses advantages of electric heat for plating baths. Article gives tips on proper heater selection, installation, power and maintenance.

A table guide to proper heater wattage, selection guide to determine right heater sheath, diagrams showing proper installation of immersion heaters and seven rules for better maintenance are included.

L—1102. Immersion Steam Boilers—A two-color, four-page folder describing the Sellers Model 105 immersion steam boilers (105 to 400 hp) will be of interest.

The benefits of immersion firing in gas-fired boilers are set forth. The folder shows that in ordinary boilers only from 10.8 to 15.2 per cent of total heating surface is represented by the combustion chamber area, while in the Sellers, 100 per cent of the total heating surface is represented.

L—1103. Nickel Alloy Coating—A 12-page brochure has been issued by General American Transportation Corp. It is designated as technical bulletin No. 258 and explains in detail Kanigen chemically deposited nickel coating. This electroless process, used for coating iron, copper, aluminum, titanium and their alloys, is said to provide coatings that are corrosion and wear resistant and have wide application.

L—1104. Conversion Coating Machine—Convert-O-Matic, a full automatic straight line conversion coating machine, is described in a new, illustrated, four-page bulletin offered by Hanson-Van Winkle-Munning Company. Also described are features of a processing barrel with cover that opens and closes automatically to receive and discharge work load, a feature of some models.

The bulletin tells how the machine operates for blackening, phosphating, bright-dipping, pre-cleaning and pickling and how it may be adapted for conveying trays and baskets, as well as larger parts directly attached to carrier arms. Also described is the machine's use of selective times to promote in-process flexibility.

Photographs show end-on and side views of Convert-O-Matic and of the automatic barrel, a typical control panel with variable timers.

L—1105. Cleaning Costs—A new method for quickly analyzing and com-

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paring metal cleaning costs is contained in a new booklet issued by the Du Pont Electrochemicals Department.

By use of standard cost factors contained in the booklet, it is claimed total hourly cleaning costs can be figured rapidly and with reasonable accuracy by inserting basic operating information into simple formulas.

Possible economies resulting include savings in operating costs of existing cleaning systems as well as selection of the most economical system for new or expanded installations.

Du Pont also has developed a more extensive cost analysis booklet containing detailed information for companies desiring a more comprehensive survey of cleaning costs.

L—1106. Ultrasonic Cleaning—Branson Ultrasonic News, a new house organ devoted to industrial techniques and applications of inaudible sound, is now available from Branson Ultrasonic Corp. Drawing on twelve years of experience in the use of high frequency sound for gaging, cleaning and testing, Branson is issuing the "News" to exchange information on the latest developments in the field. Questions concerning ultrasonic equipment are invited and technical assistance is offered.

L—1107. Phosphating Compound—A dry iron phosphating compound designed to clean and phosphate steel, aluminum, zinc and cadmium in one operation is fully described in Technical Data Sheet No. 11, a three-page usage and instruction sheet prepared by Mac Dermid Incorporated. Called Metex Durafos No. 6, the product is said to produce an iron phosphate coating on steel which serves as a paint base and a rust-proofing coating. The uniform, dense, fine-grain coating is claimed to give improved paint coverage and paint adhesion. It may be applied by spray or dip application.

L—1108. Rectifiers and Current Interrupters—Two bulletins have been released by Rapid Electric Co. Bulletin GRS-1 gives extensive data on their germanium and silicon power rectifiers. The features of each are detailed. Bulletin C1-100 contains schematic drawings and explanations of electroplating application.

L—1109. Barrel Finishing Compounds Compounds designed for deburring, burnishing and descaling metals in barrel operations are the subject of an eight-page booklet recently published by Oakite Products, Inc.

A treatise on the nature and uses of barrel finishing, the booklet points up the necessity for the right combination of media, solution, speed and loading. It tells how to preclean parts, how to select media for specific metals, shapes and sizes of parts, operations to be performed, and finishes desired. Compounds discussed include alkaline and acidic, abrasive and non-abrasive. Emphasis is placed on the need for proper barrel technique.

L—1110. Barrel Finishing Machines—Techline multiple-compartment barrel finishing machines are illustrated and described in a new bulletin offered by the Techline Division of Wheelabrator Corp.

Techline multiple-compartment barrel finishing machines are said to provide an economical and efficient way to process many parts which cannot be finished in conventional "batch" type machines, or for which costly fixtures are not economically feasible.

L—1111. Tumbling Media—"Tumbling Media for Barrel Finishing", a new 20-page, four-color booklet by The Carborundum Co. is now available.

Based on the latest laboratory and factory case studies, it is designed as a practical handbook for supervisors and operators. It treats kinds of tumbling media; types of applications; types and functions of tumbling barrels; fixturing and linings for tumbling barrels; compounds and cleansers; do's and don'ts on the use of water; analyses of typical tumbling jobs.

The tumbling booklet gives current case histories on removing paint and breaking corners; removing rust; improving finish; rounding corners; removing burrs; and removing heat treat scale. "Do's and Don'ts" on tumbling media are stated concisely.

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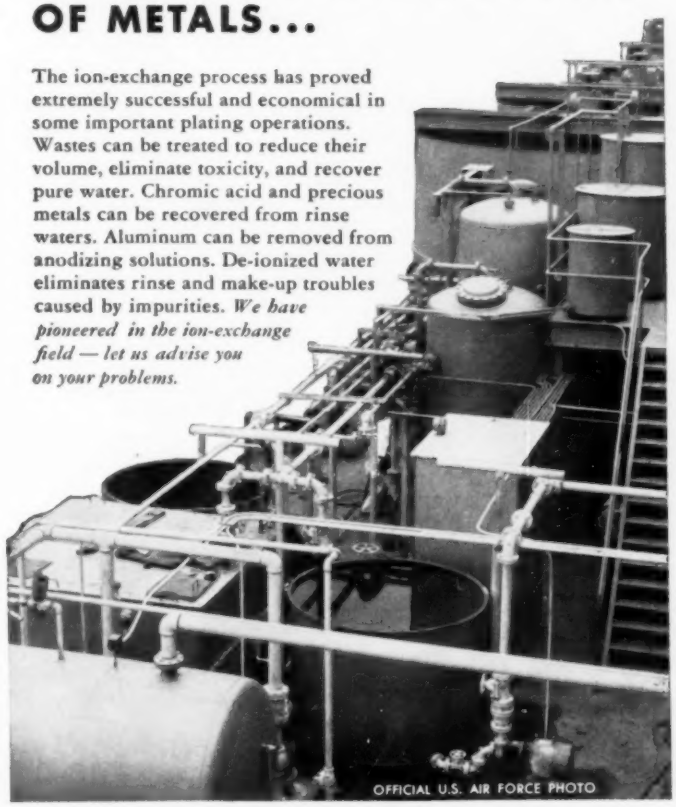

OFFICIAL U.S. AIR FORCE PHOTO

PERSONALS

Ward J. Beauchamp, has been named treasurer and **Kenneth J. Battjes,** secretary, of The George L. Nankervis Co.

Mr. Beauchamp has been with Peninsular Metal Products Corp., parent company of Nankervis, for 15 years as secretary-treasurer and continues to maintain this office in addition to his new position with Nankervis.

Mr. Battjes has been with Nankervis since 1950 and is manager of public and employe relations for the company.

W. J. Beauchamp

K. J. Battjes

Edward B. Saubestre has joined Enthone, Inc. of New Haven, Connecticut, a subsidiary of American Smelting and Refining Company, as assistant to the research director. He will assist Dr. Walter R. Meyer, president and research director, in expanding Enthone's research and development program.

Dr. Saubestre graduated from Columbia University in 1945 with a BS degree in chemical engineering. After serving in the U. S. Army, he returned to Columbia and received a PhD degree in 1952. While at Columbia, he worked with Dr. H. B. Linford on AES Research Project No. 12, "Cleaning and Preparation of Metals for Electroplating." He then became associated with the Research Laboratories Division of Sylvania Electric Products, Inc., Bayside, New York, where he specialized in electrochemical research. He has been granted two patents on electropolishing and has fourteen patents pending.

A recognized authority on metal finishing and electrochemistry, Dr. Saubestre has authored numerous technical papers on a variety of subjects and has lectured extensively. He has served on ASTM committees B-8, D-12 and E-12 and Electronic Industries Association's committees 37C (Soldering) and 40C (Printed Circuits). Presently serving as president of the New York Branch, AES, he is also on the Executive Board of the Electrochemical Society, Metropolitan Section. Additionally, he is a member of ACS, ASM, AAAS, Institute of Metal Finishing, Scientific Research Society of America and the New York Academy of Science.

E. B. Saubestre

E. L. Gessman

Elliott L. Gessman, after fifteen years in the production end of metals finishing, has joined the Metals Research Laboratories of Olin Aluminum as finishing engineer.

He received his formal education in chemical engineering at M.I.T., Queens College and New Haven College. His

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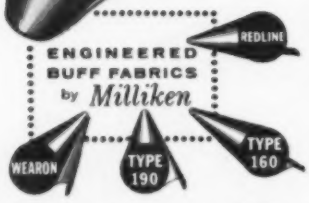

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production background includes such positions as chief engineer in charge of finishing at both Heller Hostessware in New York and Casco Products in Bridgeport, Conn.

Mr. Gessman has been assigned to the Corrosion and Finishing Branch, under Dr. James F. Murphy, where his duties include finishing research on both aluminum and brass alloys and technical service in the field.

Dr. Otto Kardos W. B. Stoddard, Jr.

Dr. Otto Kardos has been named senior scientist of Hanson-Van Winkle-Munning Co. and will concentrate his interest on electroplating processes. Dr. Kardos received his PhD at the University of Vienna and stayed on in Austria as an electrochemist. He joined HVWM 14 years ago after serving for four years as an electroplating consultant in France. He was appointed chief research electrochemist at HVWM several years ago.

William B. Stoddard Jr. has become assistant manager of electrochemical research at Hanson-Van Winkle-Munning. Mr. Stoddard was graduated from the University of Colorado in 1929 with a degree in chemistry. He has since worked in the plating field and in the general area of chemical engineering both in the U. S. and in Europe.

Eugene A. Roche was recently appointed research chemist of Hanson-Van Winkle-Munning Co. Mr. Roche took the Bachelor of Arts and, in 1950, the Bachelor of Science degrees in chemical engineering at Johns Hopkins University. He came to HVWM from American Chemical Paint Co. and prior to that association was an employe of Mutual Chemical Co.

George M. Seib, formerly secretary of Oakite Products, Inc., has been appointed vice president of the company. **Erwin H. Steif,** who was Mr. Seib's assistant, has been promoted to the post of secretary.

With Oakite since 1922, Mr. Seib has been a member of the board of directors since 1946, and has served as secretary since 1953. Mr. Steif, a graduate of Yale Law School, joined Oakite in 1948 as legal counsel, and has served on the board of directors since 1953.

Eustace Lingle, has been named vice president in charge of industrial sales and education for Oakite Products, Inc.

Mr. Lingle joined Oakite in 1929. After serving in several positions in the sales department, he was elected to the board of directors in 1939, and named vice president in 1953. He has now been given additional responsibilities in sales, sales planning, and technical education.

Harry C. Todd has been named to the newly created post of manager of distributor sales for Solvay Process Division, Allied Chemical Corp. In advancing to his new position, Mr. Todd will direct the efforts of Solvay's distributors throughout the nation. Named to succeed Mr. Todd as advertising manager is **William J. Cannon.**

With Solvay since 1927, Mr. Todd spent a number of years in calcium chloride sales work until his appointment in 1946 as manager of advertising and sales promotion.

Mr. Cannon joined Solvay's advertising department in 1954 after 16 years of experience in the advertising field. He attended Northwestern University and during World War II served as a Lieutenant in the Air Corps.

CHARLES HOLLAND

Charles Holland, president of J. Holland and Sons, Inc. of Brooklyn, N. Y. died September 16 at his home 242 W. Olive Street, Long Beach, New York.

Mr. Holland joined his late father, Joseph Holland, in 1916 and with his brothers William and Louis founded the company.

He was active for 40 years in the electroplating and affiliated industries.

Surviving are his widow, two sons, two daughters, two brothers and four sisters.

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United States Patent No.

2,724,937

issued November 29, 1955 to George R. Churchill relates to the cloth-covered, cord sisal buffing wheel **exclusively manufactured** by Geo. R. Churchill Co., Inc. of Hingham, Massachusetts, and marketed under its trade mark "Finger-Buffs"* Reg. U.S. Pat. Off.

Geo. R. Churchill Co., Inc. intends to protect all its rights granted by this patent.

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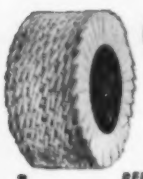
* *Churchill Finger-Buffs* are made from sisal or cloth; always bias-cut and top grade material; in all sizes from 3" to 21" diameters.*



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"C" PROCESS — for producing bright deposits on highly buffed base metals.

"NC" PROCESS — for brilliant deposits on buffed and matte surfaces.

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BRANCH NEWS

Total AES Branches U. S., Canada Australia, October 1, 1958 — 58.

BLUE RIDGE

Dixie Region Bylaws Ratified; Huston Speaker

The Blue Ridge Branch held its September meeting Friday the 5th at 6:30 at the Virginia Polytechnic Institute picnic area in Blacksburg, Va. Twenty-five members and guests were present. After the picnic the meeting was moved to nearby Chemical Engineering building where business and the program were conducted.

With President **T. R. Boggess** presiding, the bylaws of the Dixie Region were ratified by a majority vote.

A central meeting place was discussed and it was agreed that next meeting would be held in Martinsville, Va., October 3.

Art Pierdon of the Baltimore-Washington Branch introduced **Ken Huston** as our speaker. Mr. Huston is senior corrosion engineer for Armco Steel Corp. and has specialized in surface finishes for stainless steels since 1946.

All types of stainless steel and their alloy components were discussed. Photographic comparisons of corrosion at Kure Beach and other corrosion test areas were displayed. Scale removal and cleaning methods were discussed.

Mr. Huston stated that any stainless steels would rust under certain conditions. These conditions are imbedment of other steels from handling and any machine operations, and accumulation and concentrating at corrosive compounds. The importance of clean-passivation treatments was stressed, and need to prevent damaging heat treatments. After answering the many questions of members, Mr. Huston made available to the membership technical literature pertaining to stainless steels.

The program for October 3 will be a lecture-demonstration on *p*H by **C. G. Haupt,** chemist of the Norfolk and Western Railroad.

BRIDGEPORT

Orient on Copper Anodes; Meyer and Barrett Achievement Nominees

The regularly scheduled business meeting and educational session of the Bridgeport Branch was held in the main ballroom of the Hotel Barnum on Friday September 12, 1958. President **Michael Tamas** called the meeting to order at 8:15 p.m. Thirty-six members and guests were present.

President Tamas appointed the following to committee chairmanships. Publicity, **William Lindsay**; Projector, **Nicholas Sedelnik**; Sick, **Carl Schaefer** and **Herman Braun.**

Frank Kalafus via **Bob Parker** reported that progress had been made on the Christmas dinner-dance.

Henry Maskowski reported a financial loss at the recent summer outing. More disappointing than that was the complete lack of support by the Branch members.

Ray Goral reported that Bridgeport seemed to lack a candidate for nomination as third vice president.

The Special Achievement Award Committee, sponsored by the National Society, requests each Branch to select their first and second choices for consideration of this honor. The delegates from each Branch are required to forward a personal history of their nominations for review and consideration. Bridgeport's nominations for first and second choices are **Dr. Walter R. Meyer** and **Richard C. Barrett** respectively.

Edward R. Foley of Stratford Chemical Co., instructor in the course of electroplating sponsored by the New Haven Branch and offered by New Haven College wrote the president about the reopening of sessions on Monday, September 29.

The door prize was won by guest **Leonard Georgette** of Chemical Plating Co.

The meeting was turned over to **Al Ferguson,** acting for Librarian Lindsay who introduced the speaker of the evening, **Michael C. Orient** of American Brass Co. of Waterbury, Conn. Mr. Orient first showed a film depicting the evolution of the production of copper and then addressed us on "Copper Anodes in a Sulfate Bath." After a lively discussion period Mr. Orient was tendered a rising vote of thanks for his efforts.

Herman Braun asked for a rising vote of thanks to Henry Maskowski and his outing committee for their efforts.

Bob Parker

BRITISH COLUMBIA

Branch Level Golden Anniversary Proposed

The members of the British Columbia Branch met on Sept. 12 at the White Spot Dining Room for dinner, prior to the first meeting of the fall session.

Attendance was very good, with 28 members and guests present.

Nominations for delegates and alternates to represent the B.C. Branch were: delegates—**Bill Kilby, Jim Hurford** and **Bill Marquardt**; alternates: **Ralph Wolloschuk, Nelson Shepherd** and **Jim Lee.**

A proposed program for celebrating the "Golden Anniversary" was presented by President Jim Lee. Everyone was in agreement and the plans remain only to be finalized in the very near future.

The main part of the meeting was devoted to a discussion by all members of problems concerning attendance and general policy in the coming year. Each member had the opportunity to air his views and it was a lively session indeed. A committee was formed to study the suggestions made throughout the evening and to present their recommendations at the next general meeting. The committee comprises: Ralph Wolloschuk, **Doug Armstrong, Claus Schlossareck** and **Bill Cragg.**

A Program Committee was elected, consisting of Jim Hurford, **Hugh Roberts,** Bill Marquardt and **Jack Stoneberg.**

Various members expressed the opinion that they had enjoyed themselves very much throughout the evening and that this meeting had stimulated a great deal of interest.

N. A. Shepherd
Secretary

BUFFALO

Bellinger Speaks on Chromate Coatings; Buffalo Regional Host

The Buffalo Branch held its first meeting of the new season Friday, Sept. 5, 1958, at the Niagara Manor, 899 Niagara Falls Blvd., Buffalo, N. Y.

After an enjoyable dinner and business session, **John Donaldson,** our librarian, introduced **Kenneth P. Bellinger** of the Conversion Chemical Corp., who spoke on "The History and Modern Trends in Chromating." Mr. Bellinger outlined the history of chromate coatings from their inception to the present day, discussing in detail the various metals that lend themselves to the conversion coating process followed by slides and samples illustrating the intresting facets of chromate films.

The next meeting will be held Friday, October 3, 1958 at the Moonbrook Country Club in Jamestown, N. Y. with **Dr. Ivor E. Campbell** of the Battelle Memorial Institute speaking on "The Coating of Refractory Metals and the Formation of Coatings For Refractory Metals."

The November meeting will be held at the Niagara Manor on Friday, November 7, 1958. The speaker will be **Robert**

T. Gore of Metal & Thermit Corp. whose subject will be "Wire Plating."

The annual Christmas Party will be held Saturday, December 20, 1958, at the Niagara Manor.

An early reminder that Buffalo is host to the 5th Empire State Regional Meeting which will be held April 11, 1959 at the Hotel Stuyvesant in Buffalo, N. Y.

It is with regret we announce the passing of **Willis M. Fotheringham** known as "Bill" to all his friends. Bill succumbed to a heart attack on Aug. 30, 1958 while aboard his sailboat. He operated his own electroplating firm in Buffalo known as W. M. Fotheringham Inc. A member of the Buffalo Branch for 20 years, he held the offices of vice president and librarian and served faithfully on numerous committees over the years.

Robert E. Lienert
Secretary

CHICAGO

Organic Finishing Panel; Wysong Attends

The first meeting of the 1958–1959 season was held on Friday, Sept. 5, 1958 at the Western Society of Engineers. The Branch has made a change, the business meeting now precedes the technical session in order to have a more active participation of the members present. The Chicago Branch was honored by the presence of **Ralph D. Wysong,** Studebaker-Packard Corp., who serves as National First Vice President of the American Electroplaters' Society. The technical session of the evening was a "Panel Discussion on Organic Finishes," and our librarian, **Joseph C. Corre,** introduced the speakers for the evening.

The first speaker was **Vince Greci,** technical director, The Clinton Co., whose subject was "The Various Resins Used in Organic Coatings." Mr. Greci classified the materials used in lacquer formulation into two types (1) natural resins and (2) synthetic type. The natural resins, such as damars and esters, when used with nitrocellulose to make lacquers, were not good film formers and would tend to be brittle. In order to improve the quality of the lacquer, the addition of synthetic resins to the formulation had to be incorporated. The following types of synthetic resins are now being used in lacquers (1) alkyd (2) acrylic (3) phenolics (4) butyrates and (5) the epoxy resins. The alkyd resins were the first to be used because of (a) good glass (b) good film-formers (c) good adhesion (d) their economy. The phenolics have poor color retention and check badly on aging. The acrylics are very soft and mar easily on handling. The butyrates are used, in thin films, to coat aluminum for exterior use. The epoxy resins have very good chemical resistance and when modified with melamine and urea form very good, clear lacquers. However, on aging the color retention is fair (turn yellow).

The second speaker was **Rudy Hazucha,** The Clinton Co., who spoke on "What Type of Finish to Specify for Specific Applications." Mr. Hazucha grouped the lacquers that are used in the plating industry into four types; (1) bronzing lacquers (2) hardware lacquers (3) silver lacquers (4) top-coat lacquers. The bronzing lacquers are formulated using either brass, bronze or copper powders as pigments in the lacquers. The lacquer must not be acid in reaction, otherwise on aging, a reaction occurs and the powders will turn green. The hardware type are formulated for a specific use as to withstand humidity, abrasion, etc. Silver lacquers are used to protect silver plated parts from sulfide action. The top-coat, or buffing lacquers, are designated for specific use on ornamental statues and casket work. The lacquers are applied over another dried coat of lacquer.

The last speaker was **Charles Berry,** Maas and Waldstein who talked on "The Application of Various Types of Organic Coatings." Mr. Berry discussed, briefly, the following methods of applying organic coatings to materials: (1) brushing (2) dipping (3) flow-coat (4) spraying (5) roller-coating (6) silk-screening (7) airless- spray

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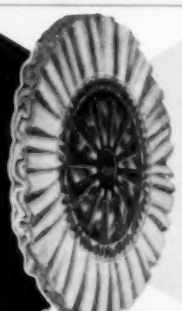

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(8) steam spray (9) electrostatic spray. The talks were very well received by the members as a very lively question and answer period followed.

Christopher Marzano
Publicity Chairman

CINCINNATI

Donate $100 for Research; Kerr on Aluminum Finishing

The meeting was called to order by President **Helmich** with 38 members and guests present.

Chuck Wise reported on the Convention and expressed his thanks to all of the members who helped make the convention a success. The Branch then gave Chairman Wise and Co-Chairman **Blount** a rising ovation for a job well done.

A motion to donate $100 to the Research Fund was carried.

The President then appointed the following as delegates and alternates to the Detroit Convention: delegates: **Bill Stephenson,** Senior delegate; **Gerard Poll, Stew Chipman;** alternates: Ezra Blount, **Lee Howald, Ed Roof.**

The Membership Committee for this year will be: **Don Gusse,** Chairman; **Jay Becker, George Bennett, Orville Hitzemann, Jack Pfeiffer, Elmer Rehme,** and **Charlie Dumont.**

The speaker for the evening was **J. B. Kerr** of the Reynolds Metals Co. who spoke on "Finishing and Finishing Techniques for Aluminum." After a brief discussion on the various alloys which are available, Mr. Kerr pointed out the four main factors in successful anodizing. The first point is good racking. Titanium has been found to be best for rack construction and, regardless of the size of the piece, there should be at least three good contact points. Secondly, good cleaning of the part is essential. It has been found that mild air agitation is helpful. Thirdly, constant temperature of the anodizing solution is a must. Good solution agitation is necessary and can be accomplished by pumping the solution at a high rate and the addition of a good air agitation system to the tank. Finally, it was brought out that good sealing of the anodized coating is a prime requirement. The water in the sealing tank must be hot and clean to accomplish proper sealing.

After an enthusiastic question and answer period the group adjourned to the Social Hour sponsored by the Chipman Supply Co., Stew Chipman and Jack Pfeiffer as hosts.

D. L. Kaplan
Secretary

DAYTON

Modjeska and Wright Speak on Printed Circuitry and Electropolishing

The Dayton Branch held their first meeting of the new season at the Hotel Biltmore on Sept. 17 with 40 members and guests in attendance. One new member was elected.

Announcement was made that **Holle Luechauer** has been appointed as a representative to the Tri-State Regional Committee and that **Richard Wolfe** has been appointed Branch Public Relations Chairman. Announcement was also made of the recent death of **Ralph Collins,** Dayton Branch member from Springfield.

Richard H. Wright, foreman, Plating Laboratory, National Cash Register Co. was introduced and he presented a short talk on their use of the Battelle electropolishing bath for deburring of parts.

The main speaker for the evening was **R. Scott Modjeska,** technical director, Scientific Control Laboratories, Chicago. The topic was "Printed Circuitry by Electroplating." This timely subject proved to be very interesting and informative. The talk was well supported with the use of numerous samples.

Refreshments after the meeting were through the courtesy of Ruco, Inc., Dayton and their representatives, **Bob Ruleff, Jim Shane** and **Don Taintor.**

R. M. Clinchens
Secretary

DETROIT

Cyanide Copper Plating Subject of Swalheim

The Detroit Branch held its meeting on Sept. 5, 1958, in the Michigan Room of

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2439	(*2.4–3.9 pH)	7387	(7.3– 8.7 pH)
1028	(1.0–2.8 pH)	8610	(8.6–10.0 pH)
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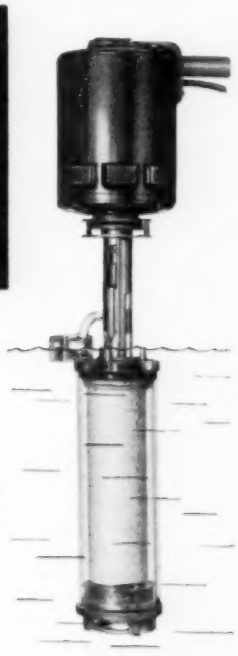

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the Statler-Hilton Hotel. One hundred and twenty-five people were in attendance.

Dr. D. A. Swalheim, of the E. I. DuPont DeNemours Co., was guest speaker, his subject being, "New Developments in Cyanide Copper Plating."

Herberth E. Head, Manuel Ben, Cleveland F. Nixon, Walter L. Pinner, Leland M. Morse and **Joseph Gurski** were installed as National Delegates by **Guy Cummings.**

Robert C. Trees
Publicity Chairman

GRAND RAPIDS

Borlet Congratulated; Wiesner Presents Hard Anodizing

The first meeting of the 1958–1959 season of the Grand Rapids Branch was held Sept. 12 at Scotties Restaurant. Forty-seven members turned out to enjoy the dinner of steak or shrimp.

President **Paul A. Waalkes** started the meeting by announcing that the Branch Ladies' Night would be held this year on Oct. 11 at the Manger Hotel (formerly the Rowe). This annual affair has been very successful in past years and promises to be better than ever in 1958 under the excellent direction of Committee Chairman **Richard O. Watson.**

President Waalkes, on behalf of the Branch, extended congratulations to **Chester G. Borlet** on his election as National Third Vice President. "Chet" gratefully accepted the good wishes of the Branch and promised great things from the National Office this year. The new Vice President asked the membership to increase their efforts to make the Society an increasingly strong and highly respected organization. "Chet" cited the remarkable results obtained by the Staff of PLATING in their attempt to make the Society a respected and technical organization. With this example, each member should proudly contribute his share to these same aims, especially in this Golden Anniversary Year.

The membership approved the election of the Branch Secretary as an automatic delegate to the National Convention and agreed to underwrite his expenses for a one-day stay. The delegates for the 1959 National Convention from the Grand Rapids Branch will be Chester G. Borlet, **Edwin J. Krook** and **Donald Schantz.** Alternates are **John Dykstra, Donald R. Smith** and Richard O. Watson.

President Waalkes announced the beginning of an intensified drive this season for new members. He asked the help of the membership to make the Golden Anniversary Year the best in AES history. Three new members were elected at the September meeting.

Librarian **Orville D. Hoxie** then introduced the honored guest and main speaker for the evening, **Dr. Harold J. Wiesner,** of the Bendix Products Division, Bendix Aviation, who spoke on the topic, "Hard Anodizing of Aircraft Fuel Metering Components." This paper had been very well received at the National Convention in Cincinnati, and stimulated a lively discussion among members of the Branch.

Doctor Wiesner compared the presently used processes for hard anodizing and enumerated the advantages and disadvantages of each. The conditions for applying thin or heavy, hard coating to various aluminum alloys were given and methods of controlling thickness on various sections of complicated shapes were discussed. Dr. Wiesner showed a statistical comparison of various thickness measurement methods and concluded that all methods utilized for both thick and thin coatings compared favorably. The results of variations in acid concentrations over a wide range of temperatures were discussed in relation to several different alloys. The importance of proper sealing was pointed out and several methods for determining the quality of seals were presented. The members expressed their interest and appreciation for Dr. Wiesner's talk by a hearty vote of applause.

Thomas C. Henner
Second Vice President

HARTFORD

Gurney and Murray Describe Thickness Testers

The regular Branch meeting was held at the Hotel Bond on Sept. 15 and 61 members and guests were present. Preceding the meeting a movie entitled "What is Electricity" was shown through the courtesy of the Westinghouse Corp.

The guest speakers for the evening were **Harold Gurney** of Fenn Manufacturing Co. and **William Murray** of Enthone, Inc. The subject was "Thickness Testers" with Harold Gurney speaking on the Dermitron and William Murray describing the Kocour electronic thickness tester.

Mr. Gurney described the use of the

Cuneo Press finds "Plus-4" Copper Anodes keep working until they're "so thin that they almost float"

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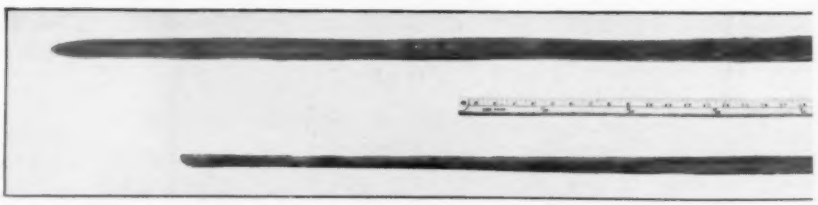

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Dermitron for checking the thickness of the coating formed from the Dow 17 process on magnesium alloys. This instrument is a non-destructive tester for both metallic and non-metallic coatings over both ferrous and non-ferrous metals. **Mr. Schneiders** of Enthone, Inc. ably assisted Mr. Gurney in describing the early development of this instrument and also told technically just how it works.

Mr. Murray spoke on and demonstrated the use of Kocour destructive tester of plated coatings. Mr. Murray described its operation as the reverse current stripping of the metal in a measured volume of solution and this stripping time is automatically recorded. This instrument is good for composite coatings but not too good when the base metal is a zinc die cast.

The technical chairman for the evening was **Richard Mullaney.**

Stanley Platoz
Secretary

INDIANAPOLIS

Max and Evans Achievement Nominees; Dr. Brown on Corrosion

On Sept. 8, 40 members and guests of the Indianapolis Branch started the 1958–59 year with a dinner meeting at Fox's Steak House. After the dinner and the introduction of members and guests, **Bert Hawhee,** the Branch President for the past year, introduced the new officers and Board of Managers and thanked the outgoing officers and members for their cooperation in the past year. He then turned the gavel to **John Hood,** the president for the coming year. The meeting was turned to **Paul Johnson,** Branch Librarian, who introduced **Dr. Henry Brown** of the Udylite Research Corporation, who spoke about "Corrosion Studies on Chromium Plate."

Dr. Brown stated that failure in chrome plate is more dependent upon environment than on base metal. Chrome plate on automobiles that are used in rural areas stands up very well, while the same quality of plate fails badly in large cities where there is severe winter weather. The problem is how to plate chrome that will stand up in late winter and spring in large cities.

The National Bureau of Standards did a great deal of work on a nickel-chrome coating using buffed dull nickel with the conclusion that only a very light coating of chrome is necessary. This has been found to not be necessarily true for bright nickel. The cracks and pores in the chrome plate are the failure points, as galvanic cells are developed in each pore. If the pores are small and close together, as in a 1 millionth of an inch coating of chrome, there is less severe attack than in a 10 millionth of an inch coating where the pores are fewer in number, but further apart. Cracks develop in coatings of 30 millionths or more. Variation of the ratios causes a variation in the pore pattern and high temperatures cause a reduction in cracking, but have little effect on porosity. Improvements in the corrosion resistance of chromeplate have been achieved with a high temperature-high ratio bath with a low voltage strike to activate the nickel plate. A good copper and nickel plate under the chrome are also very important. The talk was well received and several questions were answered by Dr. Brown.

Two applications for membership were submitted by John Hood. It was moved by **Les Reynolds** and seconded by **Loren Stevens** that they be accepted. The motion passed.

A Past Presidents' Pin was presented to Bert Hawhee by John Hood.

John Holland told the group about the October meeting which will be held at Abe Martin Lodge, Brown Country State Park, on Oct. 6. The ladies will be included in this meeting, which will be a social rather than an educational meeting.

Addison Howard, of the Paper Committee for last year, asked the wishes of the Branch in regard to publishing of the paper which had been presented at May meeting. John Holland moved and Bert Hawhee seconded that the paper be presented as a Branch paper for publication. The motion was passed.

Les Reynolds reported on the activity of the national membership committee. He requested that the Branch secretary should get new application forms from the Executive Secretary. He stated that it is important to get the title of new members.

John Holland made a motion, seconded by Bert Hawhee, that **Dr. Abraham Max** and **Tom Evans** be nominated again for the Society Scientific Achievement Award. The motion was passed.

A. M. Howard
Secretary

Putting finishing touches on a copper cylinder for one of the weekly newspaper rotogravure sections shown in the background. *Below:* Typical "fish" from Cuneo's tanks. The top one is 80" long, weighs 2 lb. 3 oz.—original 85-lb. anode was 1" x 3" x 88½". Lower "fish" is 71" long, weighs 1 lb. 4 oz.—original 74-lb. anode was 1" x 3" x 76".

LANCASTER

Gessman Speaks on Anodizing; Bylaw Changes Approved

The regular meeting of the Lancaster Branch took place on Sept. 12, 1958 at the City Line Diner, Harrisburg, Pa. with 28 members and 5 guests present.

During our business meeting **Joe Schocker** reported on revisions and changes to our existing bylaws. Changes were approved.

The following delegates were elected to the National Convention: delegates, **E. Biemiller, B. Klunk, R. Playsted;** alternates, **C. Smith, Geo. Lafever,** J. Schocker.

One application for membership and three resignations were received.

Our educational program consisted of an excellent talk on Anodizing of Aluminum by the very capable **Elliot Gessman** from the Olin Mathieson Chemical Corp. of New Haven, Conn.

I. Paul Sharretts
Secretary

LOS ANGELES

Barrett Presents Sulfamate Plating; Annual Meeting Plans Announced

There were several items of interest brought out in the business session of the September meeting of the Los Angeles Branch. Treasurer **Emmett Babcock** gave a comprehensive review of the financial status of the Society. It was well presented, and interesting.

Barrie Blackburn reported on the sustaining members and activity of the research committee during the summer.

Larry Henderson, chairman of the annual party and technical session, reported that the date of March 21, 1959 was set. It is to be held at the Beverly-Hilton Hotel. He named the committee chairmen: Banquet, **Bill Thomas;** Publicity and Sale of Tickets, **Don Bedwell;** Reservations, **Harold Wanamaker;** Educational, **Harvey Hunt;** and Noon Luncheon Toastmaster, **Clare Ver West;** Door Prizes, **Norm Painter,** with **Vonna Ott** and **Claude Weekly** named to this committee. It was announced that in addition to dancing there will be an ice show at the dinner-dance that evening.

Don Bedwell reported for the committee to review the election procedure. Recommendations were made by the committee and a lively discussion followed.

The Los Angeles Branch welcomed three men into membership.

Harvey Hunt introduced **Richard C. Barrett** of Barrett Chemical Co. who talked on sulfamate plating. Mr. Barrett covered sulfamate cadmium, nickel, iron and cobalt plating. His talk was so interesting that a question and answer session followed which was very informative.

Don Baudrand
Secretary

LOUISVILLE

Delegates and Alternates Elected; Clifford Speaks on Plating Waste Disposal

The Louisville Branch held the first meeting of the 1958–59 season on Thursday evening, Sept. 18, 1958 at Hasenour's Restaurant in Louisville.

Allen Russell, Jack Houston, and **Harlan Bowsher** were selected as delegates with **Art Oertel, Ken Reifsteck** and **Vic Blatzell** as alternates to attend the 1959 convention.

A short resume was presented by the chairman of the Membership, Publicity, Reception, Attendance, Bylaws and other committees as to how they plan to conduct their operation during the coming year.

After the business meeting, **Jim Smith,** librarian, introduced the speaker, **John E. Clifford** of the Battelle Memorial Institute who discussed the "Economics of Plating Waste Disposal." Mr. Clifford elaborated on the relative costs and methods of disposing of cyanide, chromium and pickle liquor chemicals. An important rule of thumb which members should remember about waste disposal is that in all probability it will cost as much to dispose of waste as it did to purchase the original chemicals.

The meeting was adjourned after a short question and answer session.

Louis W. Dawson
Recording Secretary

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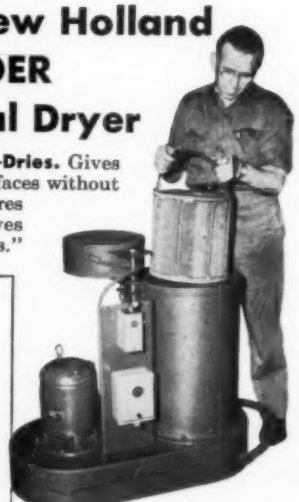

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MILWAUKEE

Bornitske Honored; Annual Racine Meeting Enjoyed

Withe the shouts from the baseball field, sweet music from a three-piece combo, the hustle and bustle of food preparations, and the "hello's" of old friends meeting again, the annual Racine Night of the Milwaukee Branch was under way. Once again it was time to meet outdoors and enjoy a well-planned program made possible by the Racine group. After golf, horseback riding, baseball, etc., hearty appetites were in evidence when the call came for roast corn along with a wonderful buffet lunch. After everyone was filled to overflowing, the regular meeting was next on the agenda.

The 491st regular meeting of the Milwaukee Branch was called to order by President **Frank Marshall.**

Fred Anderson of the Ways and Means Committee reported progress and asked for suggestions from the members at large.

Robert Toeppe reported on the Racine Night Committee and voiced appreciation for the cooperation given by the Milwaukee Branch.

Librarian **Walter Higgs** and Assistant Librarian **Ted Sobczynski** gave reports on the speakers and papers to be presented for the coming year. A fine program seems to be in store for the Branch.

Three alternate delegates were appointed by President Marshall, namely, **Henry Bornitske, Robert Steuernagel, Herman Tessman.**

There being no further regular business, the meeting was turned over to **Robert Strommen Jr.,** chairman of the Racine Night.

Mr. Strommen was given a standing vote of thanks for the wonderful program he had planned and he in turn presented his assistants, who had so ably assisted him.

The meeting was then turned over to **Red Olsen,** program Chairman who presented **George Strombeck,** Vocational School Coordinator, who reported on the progress of the formation of the Night Plating School.

After numerous door prizes were distributed, Mr. Olsen announced that this Annual Racine Night was also Recognition Night for one of the members. He then introduced Henry Bornitske as follows:

Mr. Bornitske joined the AES Milwaukee Branch on Oct. 11, 1934 and for the ensuing 24 years has never failed to extend his fullest cooperation to the Society, Branch and members. A man liked and respected by all and regardless of the pressure of his activities, is always willing to help and advise whenever called upon. A man who has held numerous offices and is now helping to direct the activities of the Branch.

Mr. Olsen presented Mr. Bornitske with a desk set from the members of the Racine Group.

A standing ovation greeted Mr. Bornitske as he accepted the gift and he voiced his appreciation of the honor given him.

F. F. Padgett
Secretary-Treasurer

NEWARK

Organic Finishing Section Launched; Spring and Sholtz Speakers

The first meeting of the year was called to order by President **Bittrich** with 102 members present. **John Banta** pointed out that a membership blank was enclosed with the last Newark Sparks and said he looked forward to a good growth year due to the Organic Finishing Section and the drive on shops that do not have members in the Branch. A placard to be sent to job shops in September was passed out for distribution.

John Kosmos reported three meetings of the Bylaw Committee and that progress had been made. Gus Bittrich stated plans were already laid for the Christmas Party.

Al Korbelak urged all members to write to their Senators and Congressmen re the AES Commemorative Stamp and distributed sample letters as a guide.

Six applications were accepted.

Gus Bittrich announced that an electroplating school would be held this year and urged registration as soon as possible. He also reported that a prize would be awarded each year for the best Timely Topic and asked **Don Foulke** to amplify. The latter stated that inasmuch as about $1,000 had been accumulated in the Electroplating School Fund, the Executive Committee had passed a motion at the Wednesday meeting just previous to the effect these funds be kept in an interest bearing account so that at least $25 be earned, said $25 to be designated as a prize for the best Timely Topic and that a committee be appointed to set down the rules governing the prize and select the 1958–59 winner. Don noted that the Timely Topic had been instituted to give the less experienced men in the Branch a chance to present short papers and urged those interested to plan and offer papers for next year. Gus Bittrich appointed Korbelak chairman of the Timely Topic Prize committee and Messrs. **DuFosse, LaManna, Irenas** and **Latawiec** members.

Librarian Korbelak opened the educational Session by welcoming the many organic finishing people present and introduced Mr. **Sholtz,** Interchemical Corporation, who presented a Timely Topic on flow coating. He explained that in the early days flow coating was widely used. Subsequently, spray coating,

MANUAL AVAILABLE TO BRANCHES

As a reference source to help Branches and Branch officers in effective Branch operation, many dedicated National and Branch leaders collaborated, without any remuneration, in preparing the comprehensive BRANCH OFFICERS MANUAL of the American Electroplaters' Society, embodying practically every conceivable Branch operating subject from membership promotion to Delegates' duties.

Within red covers bound by Chicago screws, this 225-page consolidated mimeographed looseleaf book is now in use in 36 AES Branches that ordered copies.

A limited extra quantity of the book is still available at National Headquarters for the accommodation of Branches that have not previously ordered copies. These will be sold to Branches (only), on a first-come, first-served basis so long as that supply lasts, at $5.50 per copy, including postage to one destination.

Write American Electroplaters' Society, Inc., American Building, 445 Broad Street, Newark 2, N. J. Payment should accompany order to obviate unnecessary bookkeeping expense.

40–50 per cent of coating lost as compared to 80 to 90 per cent efficiency for flow coating, achieved wider use. He noted the advantages and explained the principles of flow coating, mentioning the importance of solvent vapor and noted the usual speed is about 30′/min although modified techniques permit up to 450′/min.

Dr. Sam Spring of the Kelite Corporation, Los Angeles, then discussed "Cleaning and Etching Aluminum." He pointed out that the difficulties encountered in removing manufacturers' inks from aluminum sheet required reformulation of aluminum cleaners. He described inhibited, silicate and chromate cleaners and said that a chromic acid desmutter sometimes showed an advantage prior to alkaline cleaning. He explained that etching results in diffuse reflection, resulting in a covering up of draw marks, etc., and stated the rate of etch can vary from bath to bath. Dr. Spring explained the need for the incorporation of scale prevention additives in etching baths and foam control with wetting agents.

He concluded with a review of the chemical milling process after which the Branch gave both speakers a rising vote of thanks and adjourned to enjoy a period of refreshments and conviviality during which the writer heard a number of comments to the effect that the "kick-off" meeting had been a successful one.

D. Gardner Foulke
Secretary

NEW HAVEN
Diggin on Nickel Plating; Plating Course Reported

New Haven Branch opened its 1958–1959 Season on Sept. 9, 1958. This was our first meeting in our new location at the New Haven Motor Inn, and judging by the excellent attendance, the change appears successful.

After dinner at the nearby Three Judges Restaurant, the meeting was called to order by President **Charles A. Kuster.** One new member was elected. President Kuster read his committees for the year, and heard a report from the respective chairmen. Most gratifying was Librarian **Harry R. Taylor's** report that speakers were secured for all the remaining meetings this year. **Edward Foley** reported on the program for this year's course for electroplaters presented by New Haven College.

Following the business meeting, the program was turned over to the technical chairman, **Ed Jorczyk** who introduced the speaker of the evening, **Myron B. Diggin** of the Hanson-Van Winkle-Munning Co., who spoke on "Multiple Layer Nickel Plating." Myron gave an extremely interesting and informative picture of the new developments in nickel plating to combat corrosion in the automotive industry. His talk was illustrated with slides showing these new techniques. During the question and answer period which followed, Mr. Diggin was joined by his assistant **Almo Squitero** and together they carried on a lively discussion with interested members.

Refreshments were served following the meeting and it was generally concluded this feature would be continued in all our future meetings this year.

William E. Bridgett
Historian

PHILADELPHIA
Gurski Presents Memorial Lecture; Trumbour Memory Honored

The first meeting of the 1958–59 season was held at the Engineers' Club with 44 at dinner and about 60 attending the meeting. Branch President **Farren** welcomed guests; the minutes of the last regular meeting and the two officers' meetings held during the summer were read; Treasurer **Mentzer** gave his report; the Banquet Committee reports were dispensed with and two applications were received. First Vice President **Cogan** reported on the successful Ladies Night held last June and acknowledged the generous contributions received.

The secretary read a letter from an agency that specializes in seeking employment for older people. He also announced the passing of **Thomas Trumbour** and asked that a moment of silence be observed in his memory—which was so ordered.

A new film prepared by Behr-Manning Company "Better Offhand Polishing With Coated Abrasive Belts" was shown. It gave many applications of using polishing belts. Questions were answered by **Martin Bump.**

Following the film, **Joseph Gurski,** Ford Motor Company, gave the annual Honorary Members Memorial Lecture: "Specifications of Plating and Quality Control Aspects as Applied to the Automotive Industry." Mr. Gurski discussed nine different reasons why various coatings are selected: corrosion resistance, wear resistance, scoring and galling, stop-off for selective heat treating, brazing, soldering, electroforming, adhesion and identification. He gave and discussed the Ford thickness specifications for zinc, cadmium and copper-nickel-chromium. He stated that the substitute coatings used during the Korean War of copper, chromium and baked clear enamel were considerably more expensive and not as good as copper-nickel-chromium.

Mr. Gurski gave six classifications of testing: appearance, thickness, adhesion, salt spray per ASTM, Corrodkote and copper-acetic acid salt spray. He dis-

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cussed in detail the Corrodkote and stated that it reproduced the type of failure obtained in the field with the results obtained much quicker than the other accelerated corrosion tests.

In discussing the factors affecting the quality of plating, Mr. Gurski stressed process, design and thickness. With reference to thickness, he showed a slide that gave the results of various exposures for varying lengths of time on various plating thicknesses and stated that while thin platings almost always fail in service outdoors, properly plated parts are doing a satisfactory job.

I. Wm. Marcovitch
Secretary

PITTSBURGH

Mahlstedt First Speaker of New Season

The September meeting marked the opening of the 1958–1959 season. It was held at the Gateway Plaza.

The Ladies' Auxiliary joined the members for dinner, after which they departed for a trip on the Official Gateway Cruiser.

Following their business meeting, the members heard a very instructive talk from **Henry Mahlstedt** of Metal and Thermit Corp. His topic was "Bright Crack Free Chromium."

Ed. Keller
Secretary

ROCHESTER

Bellinger Is Speaker; Delegates Elected

The September meeting was held at the Rochester German Club. The meeting was called to order by President **Frank Beuckman.**

The following delegates and alternates were elected: delegates, **Edwin Wallin, Frank Beuckman, Linwood Morrison;** alternates, **William Tucker, Roswell Minard, Joseph Hull.**

The Christmas party committee chosen for 1958 includes Messrs. **Moffatt, Cottrone** and Wallin.

The speaker of the evening was introduced by Librarian **Ed Peneczek. Kenneth Bellinger** of the Conversion Chemical Corp. gave a very interesting talk on conversion coatings of zinc, cadmium, etc., covering the history of these coatings from beginning to end. Slides helped to make the presentation even more enjoyable. A question and answer period finished up the evening.

Linwood P. Morrison
Secretary-Treasurer

SAGINAW VALLEY

Blount Presents Illustrated Talk

The first meeting of the new year was held Sept. 10, at Zehnder's Hotel in Frankenmuth with an attendance of 63 members and guests.

Officers for the 1958–1959 year are: President, **Stewart J. Hardger;** first vice president, **D. William Snyder;** second vice president, **Raymond E. Gittens;** secretary-treasurer, **Leo C. Mangett;** recording secretary, **George E. Savage;** librarian, **Arthur J. Medwedeff;** historian, **Joseph H. Farmer.**

The speaker for the evening was **Ezra A. Blount,** editor of *Products Finishing* magazine. His topic "Impressions of the Japanese Finishing Industry" was illustrated with slides and movies and was very informative.

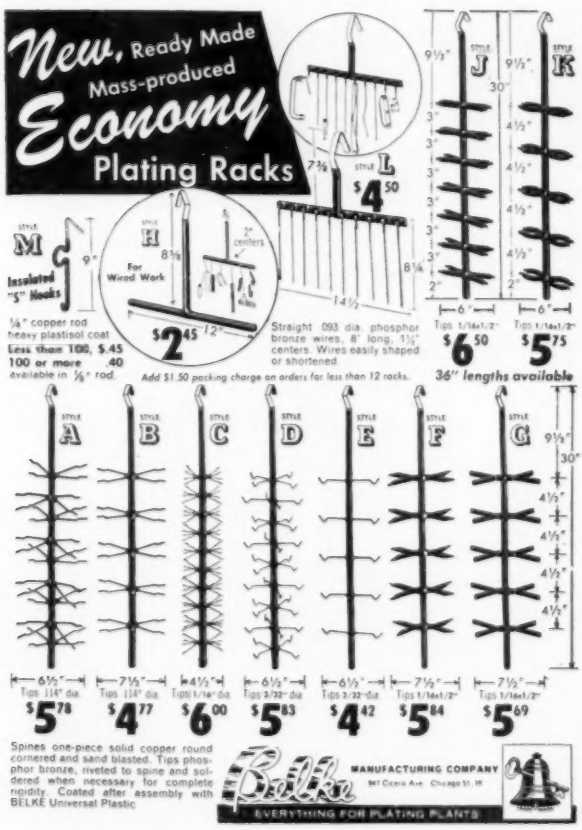
During the business session two applicants were elected to membership. The door prize, donated by **Frank Reha** of Udylite, was won by **William Burness** of Ferrofab. For his efforts in putting on the Stag Day, **Eldon Brisson** of J. J. Siefen Co. received a "Golden Minnow Bucket" compliments of Frank Reha.

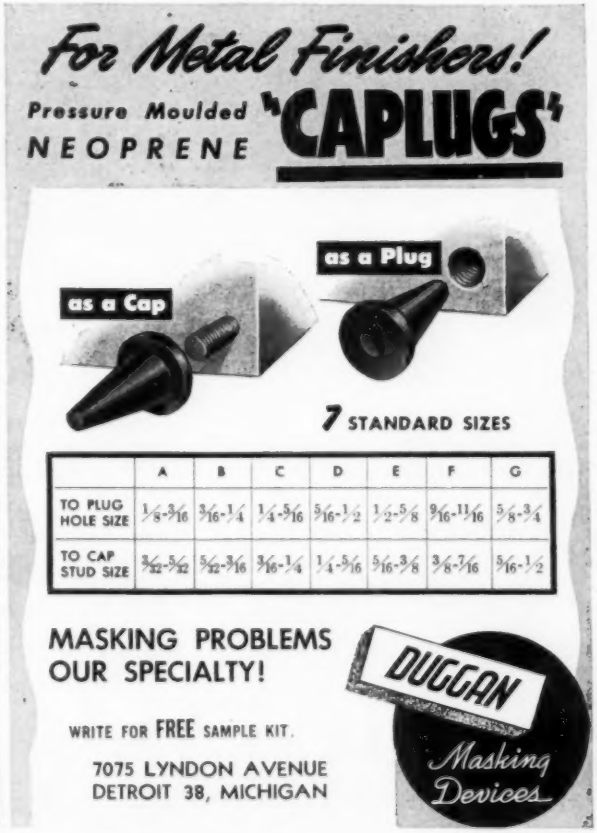
George E. Savage
Recording Secretary

SAN FRANCISCO

McDonald Talks on Control; Drive for Sustaining Members

On Sept. 11 at 8:30 p.m. the regular monthly meeting was called to order by





our president, **Jack Hite,** who introduced the speaker for the evening, **"Mac" McDonald.**

Mac, as usual, gave a very informative talk on "Control of the Plating Process." An interesting and lively question and answer period followed.

Alan Baker presented a film in sound and color covering a day of recreation for the delegates at the AES National Convention in Boston in 1941. There were many interesting "shots" of persons who are in the "Hall of Fame" of the AES.

Dominick Maviglia read an article published in 1919 written by **Henry Cavallero,** which described the working conditions and problems that faced the plater and polisher at that time. The article went on to point out the great work that **Jack Esposito** was doing to promote better conditions for those working in the plating trade. Mr. Esposito was present at this meeting and received an ovation from the members in honor of his contribution to the plating industry in the San Francisco Bay area.

Guy Condrett, Membership Committee chairman, announced that three new members had been accepted.

The following members were nominated as delegates and alternates to the National Convention: Dominick Maviglia, Guy Condrett, **Al Lee, Fred Huntington,** Jack Esposito.

Election of delegates and alternates will be held at the October meeting.

Guy Condrett announced that attendence at our regular meetings was improving and that attendence at this meeting was the highest so far this year. Guy also pointed out that we should continue to work for Sustaining Membership. He set four memberships as a temporary goal.

R. T. Coen
Secretary-Treasurer

SOUTHEASTERN
Taylor Speaks on Metal Cleaning

At the Belmont Steak House in downtown Atlanta, on the evening of Sept. 12, the Southeastern Branch, held its first meeting for 1958–59.

The meeting was called to order by President **Claude Nalley.** The minutes of the previous meeting were read and approved. Sixteen members and guests were present, with two applications for membership.

M. M. Randman, chairman of the February Dixie Regional Educational Session, gave his report, and was enthusiastic as to the various committees' progress.

Highlight of the evening was the guest speaker, **Dr. A. Lloyd Taylor,** who was presented by Librarian **Mrs. Jerita Wilson.** Dr. Taylor is research director for Ferndale Laboratory, MacDermid, Incorporated. His interesting and educational subject was, "Materials and Methods for Metal Cleaning—Particularly, Aluminum, Brass, and Die Castings."

After a lengthy question and answer period, the meeting adjourned at 10:30 p.m.

H. R. Stogner Sr.
Secretary

SOUTHERN TIER
Chrome Plating Presented by Guffie

After a summer vacation the Southern Tier Branch resumed its monthly meetings on Tuesday evening, Sept. 16, at the Langwell Hotel in Elmira, N. Y., with 28 members and guests present.

President **Morgan Rake** opened the meeting by extending great appreciation to last year's officers for fine work in making this an interesting Branch and promoting its growth. Thanks was expressed by all for the fine job done by the summer picnic committee.

Delegates and alternates were elected to represent this Branch at the National Convention in 1959.

L. Rood accepted nomination for chairman of the 1958 Christmas Party Committee.

Our librarian, **Charles Emery,** introduced the speaker of the evening **Robert Guffie,** a representative of the Metal &

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Thermit Corp. His topic was Chrome Plating. Chrome plating or work on chrome plating goes back one hundred years, however, the greatest success came about in the 1920's. Mr. Guffie described characteristics of decorative, industrial, and barrel plating baths. Much valuable information was gathered from his talk and an interesting question and answer period followed this evening's topic.

Guests attending this evening's meeting were: **B. Taylor, R. Clippard,** both of Industrial Electroplaters Co., Binghamton, N. Y., and **E. Berical** and **G. Ball,** both of General Electric Corp., Johnson City, N. Y.

B. Rossiter
Secretary

SPRINGFIELD

Korbelak Speaks on Precious Metal Plating

The Springfield Branch opened the 1958–1959 Season with the first meeting held at Blake's Restaurant, on Monday evening, September 22. After a social period and a fine roast beef dinner, there was a short business meeting.

One new member was elected.

The next item on the agenda was the appointment of the following delegates: **Robert J. Girard, Henry L. Heissfeld,** and **Martin J. Murray;** alternate delegates: **John E. Costigan, Edward R. Dupuis** and **Edward F. Koetsch Jr.**

Laurence Fountain spoke of the long devoted service and membership qualifications of two of the former Springfield Branch members who had retired from industry recently and he then proposed the names of **Philip Prouty** and **Joseph J. Mongeau Sr.,** for Honorary Membership in the Springfield Branch. The motion was seconded, and passed unanimously. The Branch Secretary was instructed to write each a letter confirming this action, and announcing their appointment to the ranks of Honorary Membership.

Librarian **Alexander R. Salmond** was very fortunate to secure **Al Korbelak,** sales manager of Sel-Rex Corp. of Nutley, New Jersey, who discussed a subject of increasing importance in the industry today, especially in the electronics field. Mr. Korbelak spoke on "Precious Metal Plating and Its Industrial Applications." A number of sample types were available for the members to study and question. The speaker received a standing ovation after the question and answer period. Incidentally, I almost forgot the commercial: Al says to write to your Congressman, to your Senator, to the Postmaster General, to anyone else you can think of; but write, so the AES can celebrate the 50th Anniversary with a commemorative postage stamp, next June.

Henry L. Heissfeld
Secretary

TORONTO

International Nickel Film Shown; Regional Planned

The Toronto Branch held its first fall meeting in the library of the Royal York Hotel Friday, September 12. 37 turned out for dinner, 54 attended the meeting to greet their new officers for 1958–59. **Bob Edwards** presided, two new members were accepted and two more were introduced. Keep this up fellows and we will close this 50th anniversary of the AES with a bang.

Herb Skelton, past president of the Toronto Branch, introduced the film by International Nickel Company of Canada Ltd., "Electrolytic Refining and Electrolytic Purification." This is a very good film, those that failed to attend missed a very interesting subject. Plans have been made for our Regional Meeting, May 2, 1959 at Niagara Falls, Ontario. The Annual Dance will be held on November 28, 1958. As the brewing industry is on strike there were a lot of Dehydrated Platers and the meeting adjourned at 10 p.m.

A. W. Wilson
Librarian

WATERBURY

Candee Receives Silver Gavel

The September meeting of the Waterbury Branch was held at the Roger Smith Hotel on Thursday, Sept. 11. A short business meeting was called to order by President **Ed Garland.** The sentiment of the group was taken on a proposed golf outing, and a possible alternative social function for our Christmas Party. Nominations were made by the nominating committee for National Convention delegates.

Ed Garland introduced **Frank Eddy** who made a formal presentation of a silver gavel to another of our past National Presidents, **Ellsworth Candee.** Mr. Candee held office in 1942 prior to the introduction of the custom of giving silver gavels to retiring presidents. He was most appreciative of the gift and promised it a conspicuous resting place.

Our speaker of the evening was **John F. Tufel,** Waterbury manager of Laird, Bissell & Meeds. His subject was "The ABC's of Investing." A short film was shown concerning the Stock Exchange entitled "What Makes Us Tick" followed by the talk and discussion. The talk was extremely well received and the questions were extensive.

The meeting was adjourned and refreshments were served.

F. A. Schneiders
Publicity Chairman

WESTERN ONTARIO

McAleer Talks on Buffing, Also Tells of Exposition

Our new season opened with a good meeting on Friday, Sept. 19, 1958 at the Wm. Pitt Hotel, in Chatham, Ontario with our new president, **Dave Mainland,** presiding. A good membership was in attendance. Past President **"Pat" Patterson** was presented with a Past President Pin by **Norm Sothern.**

The regular business was dispensed with and the guest speaker, **Howard McAleer,** was introduced by our librarian, **Jim Kelly.** Mr. McAleer spoke on "Polishing Up Your Buffing Room." Before he got involved with his subject he reminded his audience of the AES convention in Detroit, at the Statler Hotel, in 1959 and the Industrial Exposition which also will be held at Detroit. Mr. McAleer said that 80 per cent of the space was already sold. The speaker took us through all phases of buffing from manufacturing of compounds to their end use. Finally we ended with a slide projection tour of the sisal growing countries of Mexico and Cuba.

Mr. McAleer was thanked by Past President "Pat" Patterson.

Les Crookes reminded the audience that our next meeting will be held at Sarnia, Ontario, at the Guildwood Den. He promises top entertainment will be on hand after the meeting.

Refreshments after the meeting were served with the compliments of our local suppliers.

Leo Horodyski
Vice President

WICHITA

Metal Cleaning Presented by Barkard

The first meeting of the 1958–1959 season was held Sept. 24 at the Oriental Restaurant, and was attended by 18 members and seven guests.

Our speaker for the evening was **P. N. Burkard,** manager, Industrial Railroad and Aircraft Department, J. B. Ford Division, Wyandotte Chemical Corp., speaking on the subject "Recent Developments in Metal Cleaning." Mr. Burkard was congratulated heartily for a fine address and certainly a timely and educational subject directly related to the electroplating industry.

Delegates and alternates to the 1959 National Convention were elected.

A Past President's pin was presented to **Leon Lawless,** our president for the 1957–1958 season.

Our next meeting will feature a plant tour of the Boeing Waste Treatment Plant.

Estel E. Starr
Secretary

BRANCH SECRETARIES

Branch News is required of all Secretaries monthly by AES Bylaws. First of the month is Branch News deadline for next PLATING issue. Any items on hand on that date will be carried in that edition. Later arrivals will appear in the issue immediately following. In reporting talks given by speakers before the Branch, please give titles of the talks, the speakers' full identification and any other pertinent information of interest to other Branches and PLATING's broad readership.

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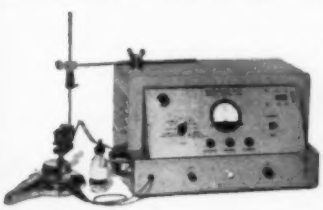

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December 6—Executive Board Special Meeting, Hotel Statler Hilton, Detroit, Mich.

December 12–13—Newark Branch, Annual Educational Session and Christmas Party, Hotel Robert Treat, Newark, N. J.

December 20—Buffalo Branch, Annual Christmas Party, Niagara Manor, Buffalo, N.Y.

January 17, 1959—Grand Rapids Branch, Annual Educational Session and Banquet, Pantlind Hotel, Grand Rapids, Mich.

January 23, 1959—Editorial Board, Hotel Statler Hilton, Detroit, Mich.

January 30, 1959—Research Committee, Conrad Hilton Hotel, Chicago, Ill.
tional Sessions and Banquet, South-

January 31, 1959—Chicago Branch, Annual Meeting and Banquet, Conrad Hilton Hotel, Chicago, Ill.

January 31, 1959—Cleveland Branch, Annual Educational Session and Dinner-Dance, Cleveland, Ohio.

February 7, 1959—New York Branch, Annual Educational Session and Banquet, Hotel Statler Hilton, New York, N. Y.

February 13–14, 1959—Dixie Regional Group, Educational Session and Banquet, Southeastern Host Branch, Dinkler Plaza Hotel, Atlanta, Ga.

February 13–15, 1959—Executive Board, Dinkler Plaza Hotel, Atlanta, Ga.

February 14, 1959—Sixth Interim Meeting, Dixie Regional Group Sponsor, Southeastern Host Branch, Dinkler Plaza Hotel, Atlanta, Ga.

March 7, 1959—Rockford Branch, Annual Educational Session and Banquet, Faust Hotel, Rockford, Ill.

March 7, 1959—Dayton Branch, 13th Annual Meeting and Dinner-Dance, Dayton, Ohio.

March 20, 1959—Editorial Board, National Headquarters, Newark, N. J.

March 21, 1959—Los Angeles Branch, Annual Educational Session and Banquet, Beverly-Hilton Hotel, Los Angeles, Calif.

April 4, 1959—Fifth Tri-State Regional, Louisville Host Branch, Louisville, Ky.

April 11, 1959—Baltimore-Washington Branch, Annual Banquet and Dance, Presentation of Pot, Washington, D. C.

April 11, 1959—Empire State Regional, Buffalo Host Branch, Hotel Peter Stuyvesant, Buffalo, N. Y.

April 18, 1959—Twentieth New England Regional, Waterbury Host Branch, Hotel Statler, Hartford, Conn.

April 25, 1959—Milwaukee Branch, Annual Meeting and Banquet, Schroeder Hotel, Milwaukee, Wis.

May 2, 1959—Boston Branch, 23rd Annual Technical Session and Banquet, Hotel Statler, Boston, Mass.

June 15–19, 1959—Golden Jubilee Convention and International Exposition, Including Fifth International Conference on Electrodeposition and Metal Finishing, Convention Headquarters—Hotels Statler Hilton and Sheraton-Cadillac, Exposition—Artillery Armory, Detroit, Mich.

July 10–14, 1960—47th AES Annual Convention, Hotel Statler, Los Angeles, Calif.

June 18–23, 1961—48th AES Annual Convention, Hotel Statler, Boston, Mass.

June 25–28, 1962—49th AES Annual Convention, Schroeder Hotel, Milwaukee, Wis. Sponsorship Midwest Regional Council.

June 24–27, 1963—50th AES Annual Convention, Ambassador Hotel, Atlantic City, N. J. Sponsorship Newark Branch.

INTERSOCIETY

November 18–20—9th National Conference on Standards, American Standards Association, Hotel Roosevelt, New York, N. Y.

November 18–20—National Conference on Air Pollution, Sheraton-Park Hotel, Washington, D. C.

January 27–30, 1959—Society of Plastics Engineers, 15th Annual Technical Conference, Hotel Commodore, New York, N.Y.

February 2–6, 1959—American Society for Testing Materials, Committee Week, Penn-Sheraton Hotel, Pittsburgh, Pa.

March 16–20, 1959—11th Western Metal Exposition and Congress, American Society for Metals and other technical groups, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles, Calif

FUTURE MEETINGS

(Continued)

March 17–19, 1959—National Association of Corrosion Engineers, 15th Annual Conference and Exhibition, Hotel Sherman, Chicago, Ill.

May 3–7, 1959—The Electrochemical Society, Spring Meeting, Sheraton Hotel, Philadelphia, Pa.

May 7, 1959—Society of Plastic Engineers, Regional Technical Conference. "Plastics and the Metals Industry," Penn-Sheraton Hotel, Pittsburgh, Pa.

May 16, 1959—Masters' Electro-Plating Association of New York, 41st Annual Banquet, Hotel Plaza, New York, N. Y.

June 21–26, 1959—American Society for Testing Materials, 62nd Annual Meeting, Hotel Chalfonte-Haddon Hall, Atlantic City, N. J.

October 11–16, 1959—American Society for Testing Materials, Pacific Area National Meeting (with Exhibit), Sheraton-Palace Hotel, San Francisco, Calif.

October 18–22, 1959—The Electrochemical Society, Fall Meeting, Deshler-Hilton Hotel, Columbus, Ohio.

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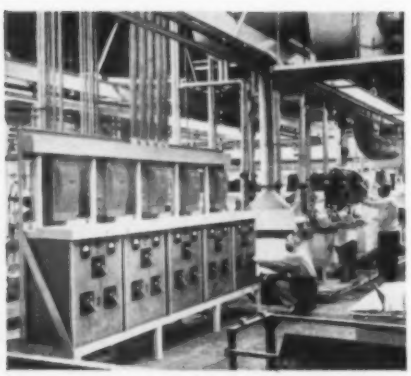

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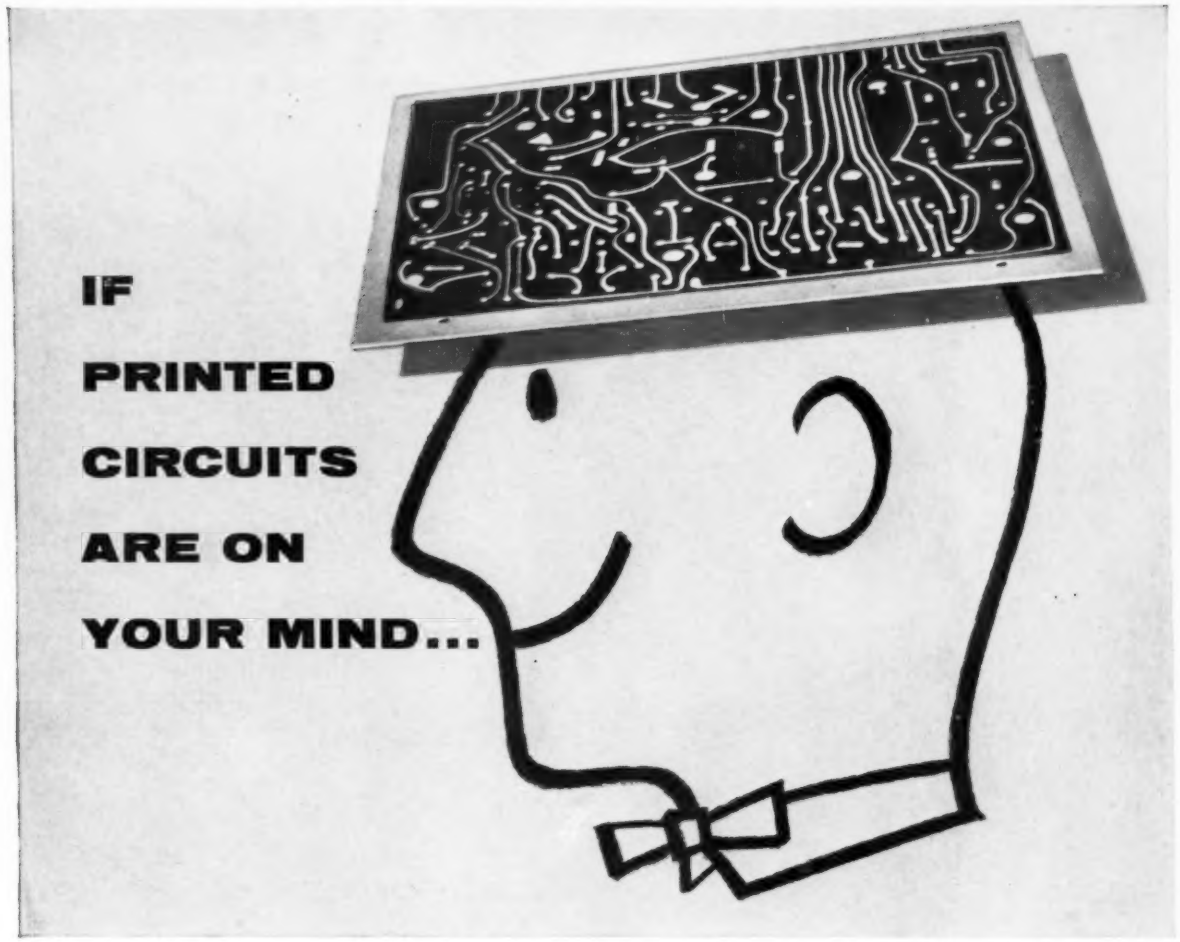

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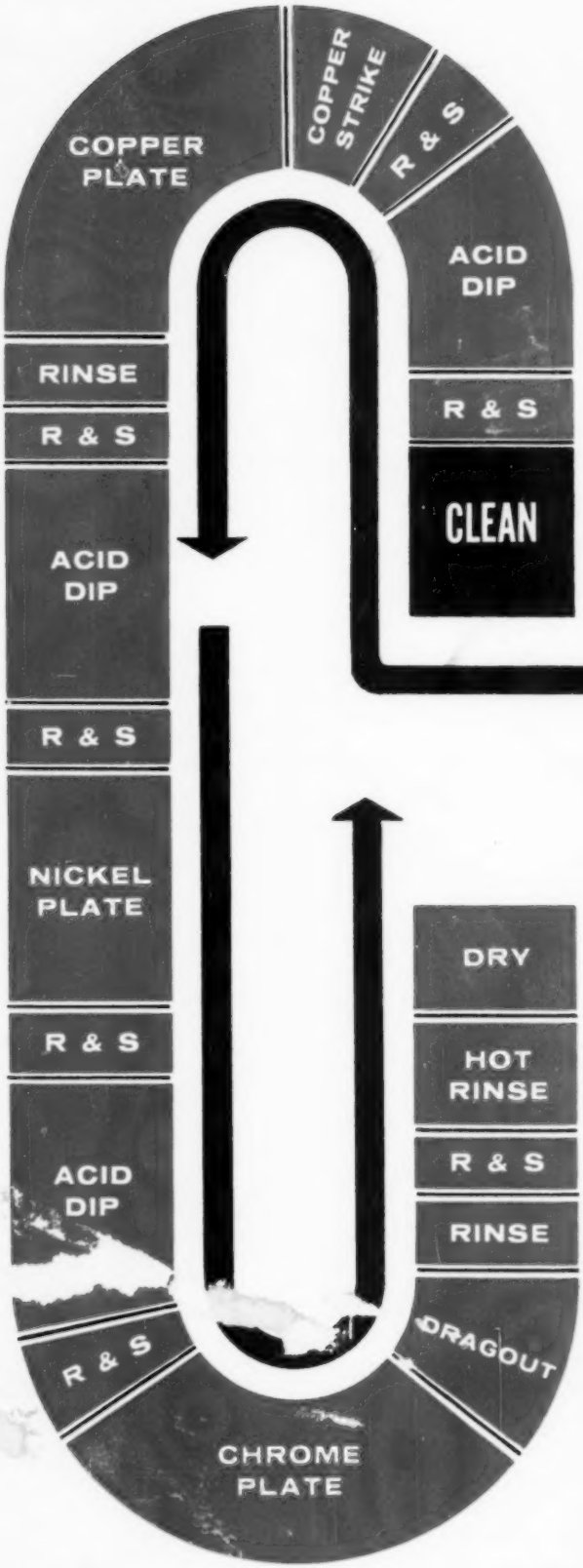

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